The Northwestern MILLER
MILLING PRODUCTION SECTION

Control of Enrichment in the Flour Mill

By *C. L. Brooke*
Merck & Co., Inc.

DURING 1951, the decennial year of enrichment, the milling and baking industries of the U.S. looked back over the decade with justifiable pride. Much had been accomplishd—a large share of the white flour produced for domestic consumption was enriched, either at the mill or at the bakery; nutritionists and public health officials alike were reporting that vitamin deficiency diseases had virtually disappeared, and the Newfoundland Surveys of 1944 and 1948 had furnished abundant proof of the real values of enrichment.

Today, after more than 10 years of enrichment, most mills are finding little difficulty in maintaining uniform enrichment levels in their family and bakery flours. It is the purpose of this article to suggest steps that may be taken for effective control of flour enrichment, and to point out the need for routine attention to this operation.

On the face of it, enrichment in the mill is a simple matter. It consists usually in feeding an accurately compounded mixture of finely-powdered pure vitamins and iron, by means of one or more special micro-feeders, into a long mixing conveyor or agitator carrying all or part of the main stream of flour. The enrichment mixture issuing from the feeder is either dropped into the flour conveyor by gravity, or picked up by an ejector and blown into the conveyor or agitator. The blower system has the advantage that feeders can be grouped together, in a place where they are more accessible than in gravity installations.

Uniformly enriched flour is the rule, but a few exceptions are inevitable. Supervisory authorities occasionally report that samples of flour picked up in retail or wholesale channels are enriched below the minimum or above the maximum levels required. Usually such conditions can be traced to failure to check feeders at frequent intervals and to keep a strict accounting of enrichment mixture consumption. The National Research Council has reported that in no instance has failure to contain the proper amounts of the enriching ingredients been traced to improperly prepared enrichment mixtures.

Enrichment Mixtures

With few exceptions, mills prefer to purchase ready-made enrichment mixtures, of the formulations recommended by the Millers National Federation.

Enrichment mixtures are extremely fine powders, grayish yellow in color, consisting of thiamine, riboflavin, niacin and iron plus a carrier, which usually is one of the cereal starches. By adjustment of the amount of carrier, mixtures are made which when fed at the rate of ¼ or ½ oz. per 100 lb. flour will produce enriched flour conforming to the Federal Standards of Identity.

Many of the larger mills prefer to use the more concentrated mixture, since less material needs to be handled, fewer feeders are required, and experience has shown that excellent distribution can be obtained in the flour. Medium and small mills usually find the less concentrated mixture more suitable for their purpose.

Each manufacturer strives to maintain a high degree of chemical and physical uniformity in his product, but small variations in specific volume may cause difference in the feeding characteristics of different makes of enrichment mixture. It is therefore important that the rate of feed from each feeder be checked carefully when changing from one make of mixture to another.

Uniform though a mixture may be, its feeding characteristics may be appreciably affected by variations in the atmospheric conditions of the mill. In an excessively humid atmosphere, feeders have a tendency to clog and feed irregularly. Under such conditions, feeder operation must be supervised carefully and frequent check weighings must be made to insure adequacy and uniformity of feed.

How Much to Feed

If the miller could be sure of a uniform flow of flour at all times, he could set the enrichment feeder to dispense exactly ¼ or ½ oz. of enrichment mixture to each hundred pounds of flour produced, and know that all the flour would contain the proper amount of enrichment material as long as the feeder was operating satisfactorily and delivering the amount called for.

However, such uniformity rarely is found, for a number of reasons, and many mills provide a safety factor by feeding 5 to 10% more than the prescribed ¼ or ½ oz. of enrichment mixture per hundred pounds of flour.

Mills with laboratory control have found it possible to make adjustments in the amount of enrichment added to different grades of flour, but most mills prefer to use the same quantity of enrichment mixture for all grades.

Enrichment Feeders

At present only two makes of feeders are extensively used in American mills for feeding enrichment mixtures into a continuous stream of flour. Both machines are precision-built and are accurate and reliable if properly maintained. They may be characterized as the "grooved-disc type" and the "feed-roll type." In the grooved-disc feeder the rate of feed is controlled by a hand wheel connected with a variable speed transmission. The feed-roll feeder is adjusted by means of a graduated slide which controls the width of the ribbon of enrichment mixture issuing from the rolls. More accurate control of the rate of feed is usually introduced by means of an auxiliary variable speed drive.

A feeder in good operating condition will maintain its setting and

(Continued on page 21a)

EASY... ACCURATE... ECONOMICAL

Flour Enrichment and Bleaching

The ORIGINAL Starch base, low ash ENRICHMENT MIXTURES.

For Fast, Efficient and Uniform Bleaching.

● STERWIN CHLORINATOR now available for immediate installation under bleaching and maturing service contract.

Prompt delivery from our stock depots: Rensselaer (N. Y.), Buffalo, Chicago, St. Louis, Kansas City (Mo.), Denver, Richmond, Minneapolis, Los Angeles, San Francisco, Portland (Ore.), Dallas and Atlanta.

Sterwin Chemicals INC.
Subsidiary of Sterling Drug Inc.
1450 BROADWAY, NEW YORK 18, N. Y.
Pioneers in Food Enrichment

The FDA Grain Sanitation Program

By George P. Larrick

IN discussing the grain sanitation program which is being conducted as a cooperative enterprise by the grain trade and the governmental agencies involved, a brief history of the events leading to its inauguration is in order.

National, state and city pure food laws have been concerned with sanitation since the beginning of this century. In 1938 Congress, after five years of study, enacted a new federal food and drug law which placed much greater emphasis upon sanitation. This law provided in essence that foods to be legal for interstate shipment must be free from filth and must not be prepared, packed or held under insanitary conditions whereby they may become contaminated with filth. The aim of the statute is to require that foods be clean and that the environment in which they are held before delivery to the consumer shall be such as to insure the cleanliness of the finished product.

These provisions relate to dairy products, poultry, spices, nuts, fishery products, and the whole gamut of foods, including grains and the human foods made from them.

At the time of the passage of this law the country was suffering from a financial recession. Many industries and many individual firms were concerned about their financial condition. Economy was widely practiced. This had an adverse effect upon sanitation because the economies included smaller expenditures for normal plant maintenance. It was not possible for the Food & Drug Administration with its limited facilities to begin simultaneous sanitation programs covering all of the wide variety of food products involved. It was necessary to begin with some industries and as improvements occurred to expand the program into other areas.

The first fields covered involved largely products which are eaten without further cooking in the home. This was because sanitation has the greatest relation to public health where the filth is consumed without cooking. Examples of articles in these categories were candy, all bakery products, and some fishery products such as crab meat.

It was recognized at that time that the cereal food industries could improve their sanitation practices. A start was made in the baking industry and in the other cereal food industries such as those that prepare macaroni and breakfast foods.

All of these programs were undertaken by first acquainting the leaders in the industries with the objectives sought and thus acquiring as much voluntary compliance as possible. Inspection of bakeries at that time showed that hundreds of them did not give enough attention to sanitation. We found that rats and mice as well as a variety of cereal insects were living and reproducing in some bakeries. Quite naturally they defiled the foods with which they came in contact.

During the course of this program a number of legal actions were filed in the federal courts, but once top management became aware of the insanitary conditions that prevailed, many industries did not wait for the government to require them to clean up but they took the ball themselves and ran with it.

When this state of affairs was reached in the baking industry we could release the chemists and inspectors who had been engaged in inspecting plants and analyzing bakery goods, so that the next step in the program could be taken.

Pilot inspections were made of representative flour mills. Here again conditions were found which did lead to the contamination of flour with insects and the excreta of rodents. We sought opportunities to meet with top management in the milling industry. Herman Fakler was the key industry representative in what later became a splendid example of indus-

EDITOR'S NOTE: The accompanying article is the text of an address delivered by Mr. Larrick at the recent annual convention of the Grain & Feed Dealers National Assn., held in Minneapolis. Mr. Larrick is Deputy Commissioner of the Food & Drug Administration, Federal Security Agency.

Flour Production in 1951 Up 2% From 1950, Census Bureau Reports

WASHINGTON—Total commercial wheat flour production during the calendar year of 1951 amounted to 229.3 million sacks, 2% above the 1950 output of 224.9 million sacks, according to the Bureau of the Census in its annual summary for the 1951 calendar year released recently.

Millfeed production during the year was estimated at 4,626,000 tons.

The Census Bureau in its summary said that, during 1951, wheat flour mills operated at 79.9% of capacity, or a slightly higher rate of operation than the 78.6% recorded in 1950.

The Census Bureau, in arriving at its estimate of 79.9% of capacity, used 1,124,943 sacks as the total potential 24-hour capacity of the industry.

The 1951 statistics released by the Census Bureau represent the production of all commercial flour mills in the U.S. They are based on reports submitted to the Bureau of the Census by mills with a daily capacity of 401 sacks or more, and estimates are made for the smaller mills. The estimates, based on 1950 data, amounted to less than 3% of the total U.S. production, the Census Bureau said.

The 1951 summary does not contain detailed data on the smaller mills. The Bureau explained that the canvass was omitted for 1951 "in the interest of economy." It is expected that the next canvass of the small mills (those of less than 400 sacks per day capacity) will be conducted in 1954, as a part of the 1953 Census of Manufactures.

In its 1950 statistics, the Bureau of the Census showed a total of 1,028 mills, of which 651 or 64% of the total number were of less than 400 sacks a day capacity. That group of mills in 1950 produced less than 3% of the nation's total flour output.

Based on total running time, mills of from 3,201 to 4,000 sacks a day capacity were the highest with an average of 93.4%. The next best group in running time were mills of from 4,001 to 6,000 sacks with an annual average of 92.5%.

The Census Bureau data show that there are 15 mills in the U.S. in the 8,001 sacks or more capacity group. This group of mills accounted for the production of 52,829,000 sacks of flour, or slightly more than 25% of the nation's total output. That group of mills had an average running time of 92% as compared with 79.9% for all mills.

On a state-by-state analysis, Kansas again led the nation in wheat flour production with a total output of 36,006,000 sacks. That is between 15 and 16% of the nation's total output. The report also shows that Kansas mills account for approximately 14% of the nation's total potential capacity.

Minnesota ranked second in total production with an output of 28,929,000 sacks of flour to recapture that position from New York mills which, according to the Census Bureau's figures, produced 26,320,000 sacks of flour. Missouri, with 21,982,000 sacks was in fourth place, while Illinois ranked fifth with 13½ million sacks total output.

Summaries of wheat flour production by states, by months, and by mills of the different capacity groups are included in the accompanying tables.

COMMERCIAL WHEAT MILLING PRODUCTION, BY STATES, 1951

	Wheat grindings (1,000 bu.)	Wheat flour production Total (1,000 sacks)	Daily (24-hr.) capacity (sacks)	% of estimated annual capacity*	Offal production (tons)	Average pounds a sack of flour Wheat	Offal
Kansas	84,331	36,006	158,803	88.9	733,648	140.5	40.8
Minnesota	66,343	28,929	125,980	90.1	568,944	137.6	39.3
New York	60,885	26,320	108,472	96.2	506,125	138.8	38.6
Missouri	51,651	21,982	93,226	92.5	452,362	141.0	41.3
Illinois	31,347	13,344	59,535	88.0	266,997	141.0	40.0
Texas	29,037	12,417	81,645	59.6	252,748	140.3	40.7
Oklahoma	22,760	9,776	45,676	83.9	195,984	140.0	40.1
Washington	21,858	9,645	46,179	81.9	179,818	136.0	41.5
Ohio	22,071	9,357	49,866	73.6	194,011	141.5	37.3
Nebraska	13,871	5,996	23,939	98.2	118,988	139.0	39.7
Oregon	12,968	5,707	26,625	84.1	105,415	136.3	36.9
California	11,161	4,896	19,873	96.1	91,827	136.8	37.5
Michigan	9,754	4,105	23,385	68.8	85,958	142.6	41.9
Utah	9,327	4,087	14,271	112.3	78,621	137.0	38.5
Colorado	9,413	4,085	18,278	87.6	78,130	138.3	38.3
Iowa	7,205	3,070	14,002	86.0	63,686	140.8	41.5
Montana	7,028	3,040	14,485	82.3	59,145	138.7	38.9
North Dakota	6,472	2,748	16,700	64.5	56,433	141.3	41.1
Indiana	6,545	2,682	26,663	39.7	61,930	145.9	46.0
Other states	51,208	21,090	157,300	52.6	472,472	145.7	44.8
Total	535,235	229,292	1,124,943	79.9	4,626,262	140.1	40.4

*Estimated annual capacity is obtained by multiplying daily capacity by the number of work days during the year (calculated on the basis of a five-day week with allowances for the following holidays: Jan. 1, May 30, July 4, Labor Day, Thanksgiving Day and Dec. 25).

SUMMARY—COMMERCIAL WHEAT MILLING PRODUCTION; 1940-51*

Year—	Wheat flour production (1,000 sacks)	Wheat grindings (1,000 bu.)	Offal production (1,000 tons)	Av. number pounds a sack of flour Wheat	Offal	Flour extraction rate
1940	212,700	494,900	4,302	139.6	40.5	71.6
1941	216,800	504,300	4,356	139.6	40.2	71.6
1942	221,100	515,300	4,444	139.8	40.2	71.5
1943	237,900	551,100	4,718	139.0	39.7	71.9
1944	243,400	565,100	4,878	139.3	40.1	71.8
1945	274,400	640,729	5,598	140.1	40.8	71.4
1946	278,900	624,740	4,895	134.4	35.1	74.4
1947	305,499	701,799	5,913	137.8	38.7	72.6
1948	279,133	639,476	5,337	137.4	38.2	72.8
1949	234,351	543,475	4,651	139.1	39.7	71.9
1950	224,899	523,411	4,534	139.6	40.3	71.6
1951	229,292	535,235	4,626	140.1	40.4	71.4

*Figures for all years represent total production and grindings of commercial mills in the U.S. For 1940-44, estimates developed with the cooperation of the Bureau of Agricultural Economics. For 1945-46, Census estimates. For 1947-50, as reported to Census Bureau by all commercial mills. For 1951 based on monthly reports from all commercial mills with a daily capacity of 401 sacks and over.

COMMERCIAL WHEAT MILLING PRODUCTION BY CAPACITY GROUPS—1951 AND 1950

1951					1950					
	Wheat flour production					Wheat flour production				
	No. of mills	Total (1,000 sacks)	Daily 24-hr. capacity (sacks)	% of estimated annual capacity	No. of mills	Wheat grindings (1,000 bu.)	Total (1,000 sacks)	Average per mill (1,000 sacks)	Daily 24-hr. capacity (sacks)	% of estimated annual capacity	Offal production (tons)
50 sacks and under					73	217	88	1.2	2,988	11.6	2,102
51-100 sacks					211	1,988	794	3.8	18,719	16.7	19,374
101-200 sacks	**	6,338	102,764	24.2	220	5,017	2,051	9.3	36,068	22.4	48,362
201-300 sacks					93	4,313	1,763	19.0	24,404	28.4	41,972
300-400 sacks					54	3,493	1,466	27.1	20,585	28.0	31,507
401-800 sacks	84	4,746	46,452	40.1	97	14,362	6,115	63.0	58,500	41.1	126,784
801-1,200 sacks	49	7,878	51,327	60.2	57	23,597	9,994	175.3	69,302	65.2	210,433
1,201-1,600 sacks	40	9,287	57,830	62.6	39	19,578	8,453	216.7	57,045	58.3	164,893
1,601-2,400 sacks	45	21,545	97,197	86.9	49	48,835	20,942	427.4	101,318	81.4	428,889
2,401-3,200 sacks	35	23,651	100,081	92.7	39	62,441	26,617	682.5	111,412	94.1	554,553
3,201-4,000 sacks	31	27,236	114,348	93.4	29	61,835	26,443	911.8	108,285	96.1	534,776
4,001-6,000 sacks	32	37,622	159,564	92.5	30	75,437	32,436	1,081.2	147,806	86.4	652,231
6,001-8,000 sacks	24	38,212	170,080	88.1	22	81,559	35,346	1,606.6	156,380	89.0	689,653
8,001 sacks and over	15	52,829	225,300	92.0	15	120,739	52,391	3,492.7	222,100	92.9	1,029,118
Total	**	229,292	1,124,943	79.9	1,028	523,411	224,899	218.7	1,125,921	78.6	4,533,746

**Not available.

Your Own Men Can Apply

Larvacide

FOR

- GRAIN in open or closed bins.
- SPOT WORK in mill machines.
- GENERAL fumigation.
- ECONOMICAL MACHINERY fumigation.
- VAULT fumigation.
- RODENT CONTROL in warehouse and mill.
- LIGHT BOXCAR fumigation for car insects.

warns of its presence in a way nobody can ignore • Kills egg life and larvae as well as adult insects • Destroys rodents without carcass nuisance No other fumigant exceeds LARVACIDE in toxicity in gas form to mill insect life.

Larvacide Products, Inc.

117 Liberty St., New York 6, N. Y.

Need New Rolls?

In addition to our roll corrugating and grinding service for the flour milling industry, the Twin City Machine Co. also supplies new rolls, and we will be pleased to receive your inquiries.

TWIN CITY MACHINE CO.

Roll Corrugating and Grinding New Rolls

527 Second Avenue, S.E. Minneapolis, Minn.

JONES-HETTELSATER CONSTRUCTION CO.

Designers and Builders for Milling Companies

1911 Baltimore Ave. KANSAS CITY 6, MISSOURI

★ Buy and Sell Through WANT ADS ★

try-government cooperation. He arranged for us to meet on various occasions with the board of directors of the Millers National Federation and we were invited to appear on the program of its national convention. The pattern which we have described in relation to the baking industry repeated itself.

Top management of the milling industry concerned itself with sanitation. A number of mill executives told us later that they had not been aware of the need for scrutiny of their sanitation and housekeeping practices. They had left these details to subordinates and the subordinates had been preoccupied with problems of production, particularly at a time when a recession was followed by a war, competent manpower was scarce and materials for normal plant maintenance were scarce and sometimes almost impossible to obtain. Nevertheless, when top management gave personal attention to the problems they were solved. Here again improvements had to be made. The milling industry got the best technical advice available on how to deal adequately with rodents and insects. We congratulate its members upon the progress they have made because today with some few exceptions the mills themselves do not contribute filth to flour.

In spite of the happy situation which developed in both the baking and milling industry it was obvious that flour and finished bakery goods were still not yet as free from filth as is desirable and practicable. It became evident that the grain itself was not clean.

The Food & Drug Administration recognized that the problem of cleaning up grain was indeed a large one. We had only the most general idea of how large the problem was and what could reasonably be expected of the grain trade in the matter of improvement. We deliberately set about to learn just what the problem was. We met with the board of directors of the Millers National Federation and discussed the problem with them. We asked that they recommend to their members that they join with us in a survey of a year's duration designed to determine just how much filth there is in wheat and to what extent present-day milling machinery removes this filth. We sought and received the advice and help of the grain trade and the Department of Agriculture in planning this investigation.

The mills were listed and a careful selection was made to obtain mills representing various categories as to size, type of cleaning and milling equipment and other important factors. Once each two weeks during the summer and once each month during the winter, mills in this group were visited by our inspectors and a complete sanitary inspection was made. This was done to assure ourselves that any filth found in the finished flour had not been contributed in the mill but was in fact coming from the grain. In addition to the sanitary inspection, samples of the uncleaned wheat were taken and this wheat was followed through the milling process. Another group of more than 100 mills was selected at random by proven sampling procedure. Carloads of grain arriving at these mills and classed by the mills as of milling quality were obtained each month during the 12-month survey. All of these samples were carefully analyzed. The results of this survey are reported in a 50-page technical document which the Food & Drug Administration has published and which the industry has reproduced and distributed widely.

Some of the conclusions are important for the purpose of this discussion.

1. Large quantities of wheat are contaminated with insects and with their excreta.
2. Large quantities of wheat are contaminated with rodent excreta.
3. Present-day milling machinery does not remove this filth during the milling process. It takes out some but it leaves substantial quantities.

There are other incidental sanitation problems such as those caused by birds having access to grain.

It is obvious that if we are to have clean cereal foods the objective must be to keep the filth out rather than to try to clean the wheat after it has become contaminated.

We believed from the beginning that if the facts were made known

UNIVERSAL MOISTURE TESTER

for Grain, Feed, Seed, Tempered Wheat and Other Mill Products

The Only MOISTURE TESTER that:

- Gives direct moisture percentage readings on a dial instantly. No charts or mathematical calculations.
- Requires no separate temperature tests; a built-in thermometer automatically indicates temperature.
- Operates electrically, yet requires no electrical outlets or batteries.
- Does not get out of adjustment of calibration; self-checking.

The Universal Moisture Tester is consistently accurate. Thoroughly dependable. Fully portable.

GUARANTEED FOR 3 YEARS

No maintenance expense. Liberal *Free* trial. Write for literature

BURROWS EQUIPMENT COMPANY

1316 MP Sherman Ave. Evanston, Ill.

SUPERIOR CARBIDE TOOLS

For All Roll Corrugating

Economical Increased Output

CORRALLOY TOOL CO.

Minneapolis 7, Minn.

The Southwestern Laboratories

KANSAS CITY, MO.

GRAIN - FLOUR - FEED

MILL COGS

We make ALL kinds. Specialize in "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "DW" and instruction sheets free.

The N. P. Bowsher Co., South Bend, Ind.

to the grain trade they would join with us in a program to keep grain clean. A start was made some three years ago when Ray B. Bowden invited us to appear on the program of this association. A Grain Sanitation Committee headed by Joseph Gregg became active at that time and the work of that committee has continued and grown ever since.

Let me say at this point that no one recognized more than we in the Food & Drug Administration that if a program of improved sanitation in the grain industry was to be a success we must have the cooperation and active help of those who produce and handle grain. We recognize that to obtain this sort of cooperation we must so conduct ourselves as to deserve it. The program must be realistic. It must not demand the impossible. It must not basically disrupt the economic structure of the grain trade. The program must be one which reasonable men who produce and store grain can enthusiastically endorse and support. We needed the help of the leaders in the grain industry in developing such a program. We think we know how to enforce the Pure Food & Drug Law since most of us have been at it for more than a quarter of a century, but there were—and still are—many facts about the grain business that have a vital bearing on the production and marketing of grain where our knowledge was limited indeed.

We are glad to report to you that we have had the help of your leaders. Details of the program which we proposed have been modified from time to time to meet realistically problems that have been pointed out to us.

Probably most of you are familiar with the details of the program as it is now in operation. The first step required a great deal of publicity aimed at elevator operators and the grain farmers. We want everybody who is interested to know what the program is and what the objectives are. Following this extensive distribution of information, inspectors of the Food & Drug Administration began spot-checks of elevators to see whether or not improvements were being made.

The initial inspections are designed to be educational and to further disseminate information concerning how to deal with insects and rodents. The authoritative information concerning the solution of these problems was provided by the Bureau of Entomology & Plant Quarantine of the Department of Agriculture and by the Fish & Wildlife Service of the Department of the Interior.

As we have said, the first inspections are largely educational. The inspectors point out to the elevator operators conditions observed which, in the opinion of the inspectors, are likely to cause the grain to become contaminated. Of course, if an elevator is found so bad that no reasonable man would tolerate the insanitary conditions involved, no period of grace can be allowed and contaminated grain from such an elevator is subject to action forthwith.

I am glad to report to you that this condition is rare. Taking a hundred inspections at random, a great many firms were found to have provided adequate sanitation procedures. Many others were in process of doing the things necessary to put their houses in order. A few were planning to make the changes but were a little dilatory in beginning until after the inspector arrived. Only one man out of the hundred expressed hostility to the program, and his sentiments were that people had been eating ground up bugs and rodent manure in the past and he did not see any reason why they should not continue to do so in the future. This man, at the time of the inspection, was deliberately mixing wheat that was obviously grossly contaminated with insects with new wheat, and thus seeking to dilute the filth. We, of course, suggested to our field representatives that they proceed against shipments from this elevator.

The second phase of this program involves the examination of wheat on the market for rodent filth. When the inspector finds that a representative sample from a lot of grain is substantially contaminated with rodent filth, that grain should not be used for human food but should be diverted to animal feed. Our obligation is to see that this occurs.

It was originally planned that during this crop year samples of wheat would be taken at random from interstate shipments and examined for insect infestation and if substantial infestation was found the product would be subject to action.

Representatives of the grain trade pointed out to us that more progress toward the objective of clean wheat could be made if the industry and the government were, during this crop year, to conduct an intensive educational campaign directed at the farm level to acquaint farmers with the steps that should be taken to keep grain clean.

During the course of our survey we had found that our men could take a representative sample of wheat, mix it and withdraw a subsample of one quarter pint, and then examine this sample for insect emergence holes. We found that, by and large, if this one quarter pint contained three grains with emergence holes there were in that one quarter pint approx-

fastest growing product in the milling industry

NEW SELF-RISING CORN MEAL MADE WITH V-90

*Coated Anhydrous Monocalcium Phosphate

Let's look at the record! Self-rising corn meal is definitely on the upswing! Right now in some territories it's actually *out-selling* self-rising flour! What's more, self-rising corn meal has gained a foothold and is increasing rapidly IN TERRITORIES WHERE *EVEN* SELF-RISING FLOUR HASN'T GAINED ENTRANCE! That's the success story of self-rising corn meal made with V-90 . . . and it's just the beginning!

Looking For New Business?

New self-rising corn meal has proved itself . . . it does bake better . . . there *is* a growing market . . . price is right . . . profit *excellent* . . . potential almost unlimited! It's easy to sell . . . ideal to promote! *Could you ask for more?*

Information Available!

Victor's manual on self-rising corn meal gives the complete story. A new recipe folder is also available. Write today.

V-90 The *Only* Phosphate Satisfactory For Self-Rising Corn Meal

Laboratory results prove that V-90 *is the* ONLY PHOSPHATE LEAVENING SATISFACTORY *for self-rising corn meal.* The wide differences in granulation, the high moisture content, and the varying characteristics of different meals require the slow action and other outstanding advantages obtained with V-90.

VICTOR CHEMICAL WORKS

141 WEST JACKSON BOULEVARD • CHICAGO 4, ILLINOIS

imately 15 internal insects that had not as yet emerged. We hoped that this method could be adopted by farmers and country elevators so that each could know the sanitary quality of the grain and whether or not it was suitable for human use.

The trade pointed out that it would be virtually impossible to disseminate this information and educate thousands of country elevator operators and hundreds of thousands of wheat growers to use the method immediately and this industry offered to undertake a very extensive program to acquaint farmers with the means of keeping the grain clean. Its leaders convinced us that greater progress would be made toward our common objective if we postponed that part of the program until the next crop year, which begins in July, 1953. The industry also offered to sponsor research designed to perfect simpler and quicker methods of judging the grain.

We are glad to report that the Manhattan laboratories of the Division of Stored Product Insect Investigations of the Bureau of Entomology and Plant Quarantine has already published one method which appears to be very promising.

The necessity for an additional examination of your grain beyond the U.S. grade determination creates some practical problems for you. While we do not pretend to have the practical knowledge of your business which would be required to solve these problems completely for you, we have seen many food industries pass through similar periods of development, and it may be that the experiences of some of these industries will be helpful to you.

For example, one of the things that worries you country warehousemen is the possibility of an unscrupulous farmer trying to pass off infested wheat as new wheat during the harvest rush. This situation closely parallels that of the creamery operator who cannot examine carefully every can of cream delivered to him every day, and yet has the responsibility of using only clean cream in the manufacture of butter. One practice which the dairy industry evolved to solve the problem was for the creamery to employ a field man to visit the dairy farms. The field man tells the farmer how to take care of his cream in order to get top price for it, and at the same time reports back to the creamery on any individual who cannot or will not cooperate, so that this individual's cream can be examined more carefully. This practice has been of value to progressive producers as well as to the dairy industry.

Another aspect of the same thing which worries you is the prospect of having to make a more thorough examination of incoming grain when trucks are already lined up for perhaps a mile waiting their turn at the scales.

This reminds us of the plight of the tomato cannery or ketchup plant, where long lines of trucks full of tomatoes form during the harvest glut. The entire tomato crop, as you know, matures in a short period, and must be handled expeditiously to avoid heavy losses from spoilage. Tomatoes must be examined for maturity, color, amount of decay, blemishes and other factors. In order to expedite these examinations, many canners have set up inspection stations some distance from the canning plants, for the convenience of truckers as well as plant management.

Truckloads of tomatoes which are not of the quality desired or which for any reason must be given special handling may thus be diverted for such handling immediately, and loads which are acceptable can be taken care of much more promptly upon arrival at the plant.

Without belaboring the point, I believe the similarity of these examples to the situation which confronts you is close enough at least to warrant consideration as idea material. There are of course others which we will be glad to discuss with you if you think such experiences hold any promise in your particular situation.

Now I would like to summarize again the differences between Phase 1 and Phase 2 of the enforcement program, and the present status of each.

Phase 1, which began in May and is continuing, is the elevator inspection phase. Any court actions brought under this phase will allege that the grain involved was held in a warehouse which we inspected and found to be contributing insect, rodent, or bird filth to the grain.

Under Phase 2 elevator inspections will not be the primary method of operation, but carloads of grain will be sampled at random and court action taken against filthy grain. Under this phase we have made a distinction between rodent filth and insect filth. The part relating to insect infestation has been postponed for the present crop year, as I stated earlier. However, sampling of carloads of grain for rat and mouse pellets has already begun, and we are glad to be able to say that there has been unanimous agreement that the rodent filth part of this phase should not be delayed.

We in the government are very well satisfied with the progress this program has made to date. We are convinced that it is moving rapidly in the direction of cleaner grain. Our purpose will be to continue to try to deserve the cooperation which you have so generously extended. Although we will have to bring some regulatory pressure our objective is to bring the fewest legal actions that are necessary to keep the program moving forward. We do not expect a miracle to happen. We do not expect instantaneous correction of sanitation problems but we know that if you and we continue to work together that within the next few years the grain supply of the U.S. will be so clean that all of us will have cause to be proud. Grain is food—keep it clean!

"SHUTTLE BRAND" DRESSES MILLING EQUIPMENT THE WORLD OVER

SILK BOLTING CLOTH & GRIT GAUZE

Distributors:
J. K. HOWIE CO.
Minneapolis, Minn.

KIPP-KELLY, Ltd.
Winnipeg, Canada

TRIPETTE & RENAUD FILS MFG. CO. WARRANTED SILK BOLTING CLOTH

Registered Trade Mark

Sole Importers for U. S. A. & Canada:
F. H. PAUL & STEIN BROS., Inc.
100 Gold St., New York 38, N. Y.

Manufactured and Warranted by TRIPETTE & RENAUD Fils

Distributors:
S. HOWES COMPANY, Inc.
Silver Creek, N. Y.

H. C. PURVINE
Bristol, Tenn.

—BREAD IS THE STAFF OF LIFE—

Medium-Size Mills Have Survived in Postwar Germany

LONDON — Notwithstanding the advance of the big milling companies in Germany which depend upon the importation of foreign wheat, a great number of medium-sized mills have survived in that country as in Austria and in Switzerland, according to a recent article in Milling which was written by a German correspondent of that publication.

The writer said that the leaders of the organizations of medium and small size mills are "opposing a tough resistance of all endeavors further to reduce the production of their members."

An analysis of the number of mills in Germany by capacity groups indicates that the smallest mills, i.e., those having an annual quota of up

to 100 tons of wheat, account for almost one half of the total number of mills while the numbers of big mills of a capacity of more than 10,000 tons is not quite equal to one half of 1% of the mill total. That latter group—the large mills—account for about 35% or more than one third of the country's total production, the writer says.

These figures deal only with mills in western Germany, that is, the recently organized Federal Republic of Western Germany. It is not known, nor can it be determined, how the mills in the area occupied by Russia have fared.

The rate of operation of mills in western Germany has, of course, been improved by the immigration of approximately 10 million refugees from Russian-dominated territory to the east. The writer, in commenting on that situation, said, "When the day comes, then the economic unity of the Reich will again be reestablished, and when the refugees will return to the east, the situation of the mills in western Germany will be somewhat precarious."

It was stated that in Bavaria the medium-sized mills have best survived. Besides, the Bavarian group is the strongest, not counting less than 4,500 mills.

The small- and medium-sized mills are vigorously supported by the existence of many small settlements of peasants and are favored by their geographical position as they are not exposed to the inroads of the foreign bread grains, as the other parts of Germany. A further help for this class of mills resides in the exploitation of water power and the fact that the population is, in Bavaria, more sparsely distributed than in the Rhineland and in the Rhur. The conditions in Bavaria resemble those in Austria where there are still about 4,000 mills in operation.

That province has approximately 550 mills which are shut down or idle, the study indicated.

As regards total production of milled cereals in western Germany, the latest figures indicate that during the 1949-50 crop year flour mills in the country processed 5,571,442 tons, that is from July 1, 1949, to June 30, 1950. The small mills—those with up to 100 tons quota—account for 7% of the total as compared with the large mills up to 10,000 tons quota 35.3% of the total.

—BREAD IS THE STAFF OF LIFE—

Grain Temperature Studies Reported by German Scientist

A method of measuring the internal temperature of grain kernels was reported at the cereal chemistry and milling technology convention held at Detmold, Germany, June 16-20 under the auspices of the German Association of Cereal Research.

The method was reported by Dr. H. Cleve and involves the use of small thermocouples. Valuation of measuring shows that air temperature and surface temperature enters the inside of the grain kernel in a relatively short time. It was possible to measure the temperature changes on the interior of wheat kernels under various methods of tempering for milling.

Dr. K. Hess of Hanover reported "a new and excellent insight into the structure of the grain endosperm" with the aid of X-ray photographs. He said that the original condition of the protein in the grain was studied and that it was possible to differentiate it into "zwickelprotein" and "haftprotein."

It was stated that the different proceedings during the swelling process of native protein and gluten can be obtained by the same methods. Observations show the existence of a gluten as well as a starch scaffold in the baked products, which formation is dependent on the complete gelatinization of the starch.

W. Joop, an engineer for MIAG, German milling machinery firm, reported on the use of pneumatic machinery for grain cleaning. His company has constructed a grain separator which combines to a certain degree the working methods of the usual machines employing form, size and specific weight of the particles to be separated. The plant consists of a vertical cylinder in which the grain is conveyed from bottom to top, with the screenings being removed at different stages depending upon their reaction to the air stream.

H. Schafer of Detmold reported, for the first time, it is claimed, figures comparing different methods of conditioning as far as they could be realized by laboratory work. It was said that it appears that vapor conditioning of grain proves advantageous with milling and baking with an increase in the extraction rate, reduction of power requirements during milling, improvement of the crumb texture of the bread, etc.

Dr. P. F. Pelshenke and Dr. A. Schulz, of the grain research institute reported on the use of alpha amylase in baking. The chemists reported that the effect of the fungal amylase can mainly be based on the influence of degradation of starch during the dough and baking phases. He reported improvement in the crumb color, volume and texture, as well as in the color of the crust.

Approximately 500 cereal chemists attended the conference.

MADE AS CAREFULLY AS YOUR BEST TAILORED SUIT

Top-grade bagging materials plus expert designing and careful construction, give V-C Multiwall Bags the ability to stand rough, tough treatment in handling, in shipping and in storage.

V-C Multiwall Bags are available in standard sizes, attractively printed to your specifications in the following styles: sewn open mouth, sewn valve with sleeve, and plain valve with no sleeve or with tuck-in sleeve.

Write for full information, or discuss your bag requirements with a V-C representative. Get the facts *now* on V-C's speedy deliveries and expert technical assistance.

VC PRODUCTS

Virginia-Carolina Chemical Corporation

BAG DIVISION: 9th and Perry Streets, Richmond, Va.

DISTRICT SALES OFFICES:

Atlanta, Ga. • Wilmington, N. C. • E. St. Louis, Ill.

BAGS • PHOSPHATE ROCK PRODUCTS • COMPLETE FERTILIZERS • CHEMICALS • CLEANSERS • TEXTILE FIBERS • PEST CONTROL PRODUCTS

BRITAIN'S FINEST MILL

Clothed throughout with

Accurate in weave, dependable in use—just two of the reasons why "Canmore" Brand is used exclusively in Britain's magnificent new Solent Mills at Southampton.

CANMORE BRAND

Pure Silk Bolting Cloth and Grit Gauze

Thomas Robinson and Sons Ltd.
Rochdale · England

Robinson

London Office:
Africa House · Kingsway · London W.C.2.

British Firm Builds First All-Metal Mill

WHAT is claimed to be the world's first all-metal mill has been built by Henry Simon, Ltd., British milling engineers. The trend towards the ultra modern in mill design, already apparent in postwar construction undertaken in Germany, has been carried a stage further by the Simon firm and the designers have now evolved a mill which has the metallic gleam associated with all ideas of futuristic development.

The immediate effect is one of cleanliness and streamlined efficiency on every floor for all machinery is of metal construction the effect being heightened by the use of metal spouting installed throughout the mill and screen room. Low pressure pneumatic conveying, now a regular feature of all new mills is employed for transporting the mill stocks and aerofoil fans are used in conjunction with the system and for the purifier exhaust.

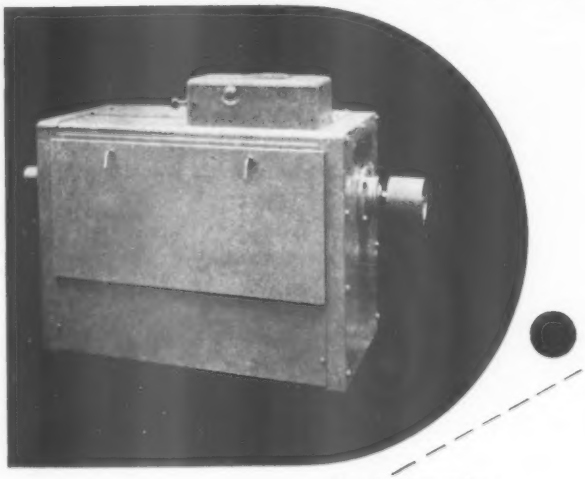
In undertaking erection, Simon engineers had a clear start for the original mill, situated at Driffield, Yorkshire, England, and owned by the old established milling firm of E. B. Bradshaw & Sons, Ltd., was completely destroyed by fire in 1949. Only the warehousing accommodation was saved and this has been incorporated into the new construction which consists of a silo, power plant, screenroom, mill section, laboratories and offices. The wheat cleaning department, like the mill itself, is equipped with metal machines and incorporates the Simon Stabilisor conditioning process, together with a complete and flexible range of wheat cleaning machinery.

The spouting in the screenroom is made from prefabricated steel sections. Additionally, precast check boxes with rotating inlet and outlet joints have been fitted at all changes of direction of the spouting thus eliminating wear on the spouts by allowing wheat to fall on wheat.

The mill, which started up at the end of August, has a nominal capacity equivalent to 900 sacks of 100-lb. basis 25-hour working and is housed in a steel and brick building which harmonizes with the surrounding countryside.

The designers have been successful in their aim to give flexible production facilities so that the change from bakers' to biscuit flour, a regular feature of the firm's activities, could be made with ease. There is a five-stage break system three scratch

KNOCK OUT THE FLOUR BEFORE IT GOES TO FEED with THE BUHLER IMPACT FINISHER



New finishing action.
Higher finishing efficiency.
Permits full control during operation.
Lower ash "throughs."
Requires smaller plant space.
Low power consumption.
Low maintenance.

Big Savings for Flour and Rye Millers—Ask us Where to Place This Machine in Your Flow.

BUHLER BROTHERS
INCORPORATED
ENGINEERS FOR INDUSTRY SINCE 1860
2121 STATE HIGHWAY #4
FORT LEE, NEW JERSEY
CANADIAN REPRESENTATIVE
C. RUDOLPH BOOR
24 KING ST., W. • TORONTO, CANADA

Don't Neglect Elevator Legs—They Start Fires

Never Force a Choke—Dig it Out.
Inspect the Head and Boot Bearings Regularly, According to Instructions.
Check Pulley and Cup Belt Alignment.
Do Not Operate Idle Legs.
Watch Drive Belt Tension.
Clean Space Under Head Pulley Regularly.

MILL MUTUAL FIRE PREVENTION BUREAU
400 W. Madison St. CHICAGO, ILL.

passages and 14 reductions. Type G roller mills, finished in cream enamel and fitted with single vertical feed spouts, 22 in all, make up the break, scratch and reduction systems. All the break roller mills are chain driven and, together with the machines employed on two of the scratch passages, and on three reductions, are fitted with three speed gears for the feed rolls. The rollermills on the last three stages of the break system and on all stages of the scratch system have "Rollmaster" throwout mechanisms. Two bran finishers are used at the end of the break system to treat coarse and fine bran and one more is employed on the tails of the last two reductions.

Metal purifiers are used on all purifications. They have been manufactured from pressed, folded and extruded aluminum sections designed to minimize the chances of infestation by the incorporation of easily removable and cleanable parts and by replacing worm conveyors with shaker conveyors. The purifier exhaust system employs a 64-sleeve suction filter dust collector and a 4-stage 30-in. aerofoil fan unit.

Metal faced "Flowmaster" plansifters with double skins of pressed aluminum and sieve trays of non-corroding aluminum alloy are used on all dressing operations. Each sifter has its own motor drive, housed above the feed board.

The pneumatic conveying system is divided into two separate systems, each with its own 48-sleeve suction filter dust collector and five-stage 19-in. medium pressure aerofoil fan unit and a two-stage 30-in. aerofoil fan unit on low pressure. The mill has 50 pneumatic lifts. All the pneumatic pipes and metal spouts have been erected in the center of the mill so that all the machine floors are completely unobstructed. Spouting is made from prefabricated lengths of aluminum alloy tubing with joint clips and angle pieces.

The spouting and machines reflect rather than absorb light and this provides a well lighted and spacious appearance throughout the whole of the interior.

The laboratory is well equipped and all the instruments used are of recent development.

Head of the firm is John B. Bradshaw, reputed to be a miller of the first rank and a keen supporter of technical education in the industry. He has taught milling subjects in Hull and York and was the first president of the Hull Flour Milling Students Society. Additionally, he has held many offices in the industry's trade associations while his writings on trade and technical subjects have appeared in many publications devoted to the business of flour milling and animal feedstuffs manufacture.

Associated with Mr. Bradshaw in the Bell Mills, which includes an affiliated plant at the Riverhead Mill, are his brother, A. E. Bradshaw, and his two sons, P. N. and E. B. Bradshaw. The family has been associated with the milling business for many years and an ancestor, Philip Bradshaw, operated three mills in Bedfordshire towards the end of the 18th century. The present firm was founded by Philip's grandson, E. B. Bradshaw, father of John B. Bradshaw, when he took over the Driffield mill in 1894. All the present directors of the company were born in the Mill House adjacent to the mill.

Mr. Bradshaw, who has extensive farming interests, maintains a stable of Suffolk Punch horses and some of these are used in the firm's transportation system. The old, however, mixes with the new for a large fleet of modern trucks is used to cover the trade worked over a larger area.

——BREAD IS THE STAFF OF LIFE——

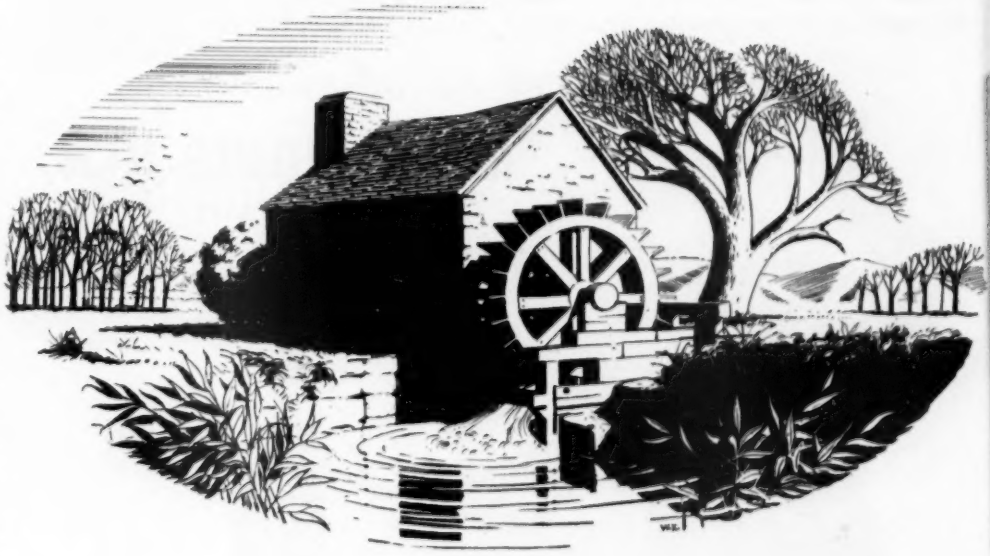
DUNWOODY STUDENTS VISIT LARGE BAKERIES

MINNEAPOLIS — On Wednesday, Sept. 17, the staff and students of the Dunwoody Baking School of Minneapolis visited the baking department of the National Food Stores. William Booth, plant manager, welcomed the group, and with his assistant, Jerry Corrigan, conducted the group on a tour through the plant.

The students had an opportunity to observe large plant operations and to note the various types of equipment being used. After the tour, refreshments were served and the group then visited the baking department of the Red Owl Stores. Tom Williams, production superintendent, welcomed the group and conducted them through the plant. He explained the various processes used in the production and also the functions of the various machines.

Both bakeries have a large production, and in each one there is a section set aside for making retail products for bakery departments in a number of their super markets. Consequently, the students had an opportunity to study both large shop production and so-called small shop operation. Tours of this type are an important phase of the teaching program at Dunwoody Baking School, according to A. J. Vander Voort, head of the school and technical editor of The American Baker magazine.

How to make your good food better



Now—the watermill is a curiosity. You must supply today's demand with today's methods. But modern milling practice loses some of the nutritional benefits present in Nature's wheat because of consumers' demand for patent flour and for white bread and rolls. How sensible it is that you restore valuable health-giving vitamins and minerals through enrichment. Your achievement in making your good food better by this simple process of enrichment has the support of qualified authorities—physicians, nutritionists, dietitians, and of consumers themselves.

keeping faith with nature **ROCHE**

VITAMINS FOR ENRICHMENT

VITAMIN DIVISION • **HOFFMANN-LA ROCHE, INC.** • NUTLEY 10, N. J.
In Canada: Hoffmann-La Roche, Ltd., Montreal, Que.

Forced Ventilation and Air Filtration in Mill Buildings

Air filtration is one of the fundamentals of air conditioning, and as more plants have been installed in flour mills in this country for the purpose of air filtration and forced ventilation than for complete air conditioning, it is important to examine some of the methods tried out and the advantages of possible alternative systems.

The principal advantages of forced ventilation may be summarized as follows:

(1) Lower temperatures throughout the mill, resulting in cooler stocks and better dressing.

(2) Replacing, more easily, air exhausted via mill machinery and, therefore, increasing the efficiency of the exhaust systems.

(3) A more even distribution of fresh air to each floor in the mill, thus minimizing machine sweating caused by draughts.

(4) The use of cleaned or purified air, if the ventilating system is equipped with an air filter, resulting in cleaner and more hygienic products and also a cleaner mill.

Normally, in any mill which is not equipped with a system of forced ventilation, the air exhausted via purifiers, roller mills, etc., is replaced by air which is literally sucked in wherever it can get in. This is usually between window frames when all the windows are closed in winter, door frames, and through open doors. In summer, when higher outside temperatures prevail, the tendency is to open windows, causing draughts, which is bad practice, especially on the purifier floors.

If air is being sucked in, then the mill is operating under reduced pressure, the degree varying with the airtightness of the building, but this produces a back pressure on the exhaust fans causing less air to be exhausted and consequently a decrease in the efficiency of the exhaust system. In addition, if less air is being moved through the mill, the air temperature will rise initially on the roller floors, gradually increasing the air temperature of the upper floors through convection. Higher temperatures in turn result in warmer stocks and a decrease in sieving efficiency.

Description of a Simple System

A simple system of filtration and air ventilation has been carried out in one small mill, situated in an industrial area, with success. It consists essentially of an air washer, fan and trunking for air distribution throughout the mill.

Air is drawn through the washer, equipped with coarse sprays, so that the water is not really atomized and hence the air does not take up a great amount of water. The coarse sprays eliminate much of the larger dust and soot particles followed by further cleaning action by the scrubber plates as the air is drawn towards the fan. Air temperature is reduced a few degrees by the slight vaporization of the water. (The latent heat required for the change from liquid to vapor is taken largely from the air, resulting in its cooling.) The air is then distributed throughout the mill by metal trunking of rectangular section at ceiling level with short, round, vertical metal pipes branched off at regular intervals. These pipes are fitted with deflector plates at the outlets. In this manner the air does not blow directly towards the floor and machines, but is deflected outwards and upwards. Branch pipes also blow the cleaned air directly into the elevator legs.

The atmosphere in the mill is of a pleasant freshness, especially on the roller floor. Remarkably cool stocks are delivered from the breaks plansifters which are not exhausted, but, as already explained, cleaned air is blown into the elevators carrying these stocks.

When the fan was stopped, on a warm, fine day, the air temperature on the roller floor rose from 68° F. to 75° F. in two hours. Although not immediately apparent during this short period with no forced ventilation, sifting on the breaks plansifters becomes sluggish, eventually followed by fairly rapid blinding of the silks. The opinion was expressed that better milling results are always obtained when this system of air cleaning and forced ventilation is in operation.

Partial Control of Temperature

Variations of, and additions to, the system just described can, of course, be adopted with possible advantage. If, for example, an air heater was installed after the washer it could be operated during extremely cold weather and especially during, or just prior to the start-up of the mill in order to heat the building. Alternatively, smaller heaters could be in-

Experienced mill operators everywhere fumigate periodically with Liquid HCN because it destroys insects, insect eggs and rodents in their hiding places. When properly applied by an Industrial Fumigation Engineer, Liquid HCN assures a plant-wide clean-up of pests in a matter of hours.

Liquid HCN has no deleterious effect on grain and flour stocks and, after proper aeration, leaves no taste or odor. It does not affect the baking qualities of flour.

Consult your local Industrial Fumigation Engineer, or write us for the name of one near you.

Other Cyanamid Products for Effective Pest Control

Cyanogas® G-Fumigant . . . kills insects and insect eggs in stored grain.

Cyanogas A-Dust . . . destroys rodents outdoors.

Write for fully descriptive literature.

"I take my hat off to

AERO* LIQUID HCN,

FUMIGANT

for its outstanding control of insects and rodents!"

*Trade-mark

American Cyanamid Company

Agricultural Chemicals Division

30-U ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

BRANCH OFFICES: Brewster, Fla. — 3505 N. Kimball Ave., Chicago 18, Ill. — 1308 Donaghey Bldg., Little Rock, Ark. — 111 Sutter St., San Francisco 4, Calif. P. O. Box 808, Winchester, Va. — 5025 Pattison Ave., St. Louis 10, Mo.

SANITATION MATERIALS, SERVICE
For the Milling, Grain and Baking Industries
FUMIGATION ENGINEERING CORP.
Established 1893
2913 Harriet Ave., Minneapolis 8

stalled in the main trunking to each floor and operated individually to obtain similar temperatures on each floor. Again, if instead of recirculating the filtered water of the washer, which tends to assume the same temperature as the air, a constant supply of cold, fresh water was sprayed and allowed to run to waste, a better cooling effect of the air could be achieved which would be an advantage in hot weather.

There is, of course, no real control of humidity and temperature in this system, and one of the disadvantages of having a washer as an air filtering medium is that the relative humidity of the air is increased and this can be a distinct drawback on an exceptionally hot and humid day. Under normal conditions, however, although the humidity of the cleaned air is higher after leaving the washer, as it becomes heated inside the mill by radiation and surface contact, chiefly with the roller mills, the relative humidity is decreased again.

Application of Other Filters

Dry and viscous filters have an advantage in that the humidity of the incoming air remains unchanged and they can operate in very low temperatures. The washer, used simply as described will, of course, freeze up when the temperature of the air falls below 32° F. The spray nozzles do in time become corroded and also deteriorate in efficiency more rapidly if hard water is used. A bank of dry or viscous filters could be installed if necessary, instead of the washer or wet filter.

It is not known whether an electrostatic precipitator has been used as a filtering medium in flour mills in this country, but it is thought to be extremely unlikely, largely because of initial cost. The efficiency is much greater than any other type of filter for dust down to the smallest particle size and it will even extract common bacteria from the atmosphere. There is also the possibility that the ozone liberated by the ionizing unit may have a bleaching effect upon the flour. For complete hygienic air cleanliness the electrostatic precipitator would be the ideal filtering medium to use, especially in industrial areas, and may conceivably be installed in the flour mills of the future. It is an expensive refinement, but as flour millers are the producers of the principal foodstuff, every effort should be made to maintain as high a standard of purity as possible.

Whatever type of air filter is used in a system of forced ventilation, the fan capacity of the plant should be such that all the exhausted air from the mill is completely replaced by cleaned air, plus a little extra, so that the mill operates with an internal air pressure very slightly above external atmospheric pressure. This will ensure that no unfiltered air is drawn into the mill. Needless to add, all windows and doors in the mill building should be kept closed.

Recirculation of Air and Heat Conservation

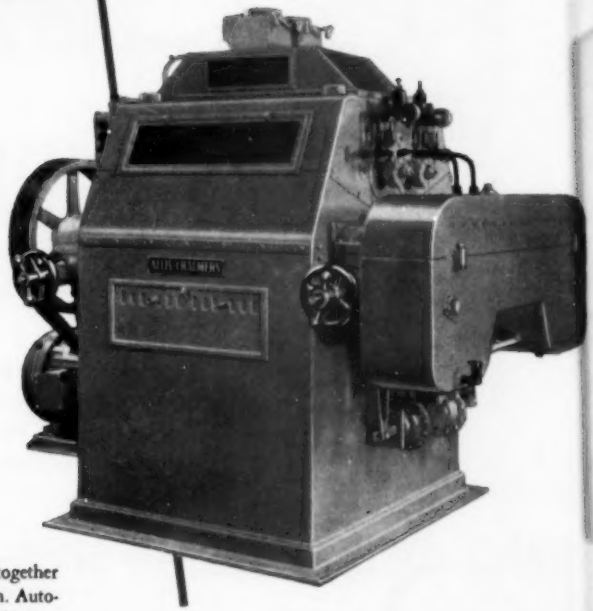
Experiments have been conducted in at least one mill to make use of the higher temperature of exhausted air from the mill and recirculate the air in order to conserve heat and keep the mill warmer during very cold weather.

The principal drawback of such a scheme is the high humidity of the air leaving the exhaust system owing to evaporation of moisture from mill stocks. Obviously, all the air cannot be recirculated as it would quickly reach saturation point and condensation would commence on the walls and ceilings. The condition in the mill would be intolerable with air at 100% relative humidity and at a high temperature. Dressing efficiency would be almost nil, apart from the high dust concentration.

Partial recirculation can then be considered. This may be achieved by drawing some of the air from the dust room and which has passed through dust collectors first, and returned to the filter medium and intake fan. The resultant humidity level inside the mill will still be high, and dry or viscous filters would become choked very quickly owing to the relatively large concentration of fine flour dust in the returned air. Alternatively, air could be returned which has been cleaned through a suction filter dust collector first, in order to reduce the high flour dust concentration prior to partial recirculation, either through the main air intake or directly back into the mill through a separate system of distribution trunking.

The merit of either system is very doubtful. What advantage is gained by heat conservation is largely offset by higher humidity, a less clean atmosphere, the "musty" smell which accompanies air that has already once passed through the milling system, and the extra trunking necessary. As the necessity for heat conservation will occur only in very cold weather during a short period of the year, the installation of an air heater in the intake system such as has already been described is thought to be a more practical plan. Of course, in countries such as Canada, which have long and extremely cold winters with subzero temperatures, partial recirculation of heated exhaust air is a much more feasible and economic proposition, especially when the outside atmosphere invariably

Automatic... ROLL SET and ROLL RELEASE prevents metal-to-metal contact



MODERN *AirSet* Roller Mills don't depend altogether on the skill of the operator for best operation. Automatic features are engineered into *AirSet* Mills to make your man-hours more productive and to save on maintenance.

The automatic roll set and roll release, for instance, prevents metal-to-metal contact like this: when feeder starts, the control system, through air diaphragm, automatically brings rolls into the pre-set position for milling and maintains a uniform grinding pressure the full length of the rolls. This controlled pressure grinding eliminates unequal grinding pressures common to spring tension. When stock stops flowing or roll motor is off, *rolls open automatically.*

This is only one of the reasons why *AirSet* Roller Mills can make your grinding more efficient . . . your man-hours more productive . . . your operation more profitable.

Why not call your nearby A-C sales office for complete information? Or, write Allis-Chalmers, Milwaukee 1, Wis.

A-3816

AirSet is an Allis-Chalmers trademark.

AIRSET ROLLER MILL

the closest approach to automatic milling!

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

SERVING THE FOOD INDUSTRY FOR 104 YEARS

is of unusually low humidity. To mix warm, moist air with cold, dry incoming air in these circumstances would be of distinct advantage, providing it has been filtered.

An Experiment with Wall Filters

In order to obviate the necessity for an intake fan and air distribution trunking, thereby reducing installation costs, an idea was put into effect in one mill to introduce viscous air filters into the wall below the windows on the roller and centrifugal floors. As the exhaust fans extracted the air from the mill, fresh air was forced through the filters in the wall. As a device for reducing costs the principle was worth a trial, but the attendant snags were quickly apparent.

Viscous filters oppose the free passage of air, setting up a resistance, and consequently the internal mill pressure was lower than the external pressure, which reduced the efficiency of the exhaust system. Air would also be drawn into the mill at any other point where it could flow in—unfiltered. Then in cold weather the incoming air swept across the floor and several instances of sweating occurred in the roller mills. This was partly counteracted by fitting baffles behind the filters to divert the cleaned air upwards towards the ceiling.

The experiment was not entirely successful and was abandoned in favor of a bank of filters installed on the ground floor of the mill, followed by an air heater, through which the air was drawn in by an axial-type fan. It was, of course, only intended to heat the air in cold weather. A similar unit was planned for the top floor of the mill.

This arrangement is not ideal, especially from the air distribution point of view, but filtration of the air is achieved with a saving in cost by elimination of air distribution trunking.

The fan usually draws the air through the filter directly from the atmosphere and positioned so that a minimum amount of ducting is required before the cleaned air is distributed to the mill. Care must be taken when planning the position of the air intake so that unnecessarily dirty and dusty air is not drawn in. For example, the filter should not be in close proximity to passing traffic throwing up dust and emitting fumes, nor in a position where dust from grain intake or exhaust cowls would become a nuisance. For the latter reason it is not advisable to have the air intake installed on the roof—a position often favored in modern flat-topped buildings not emitting smoke.

If space is not available for the installation of a filtering medium and fan inside an existing mill, the unit can be situated in the most convenient position outside the mill, but the ease of accessibility for cleaning and maintenance purposes in all weathers should be considered carefully.

In a new mill it is better to plan the filter unit inside the building, with a section of the wall replaced by louvres through which the outside air can be drawn easily into an airtight space before entering the filter and fan. There should be access to this space in the form of an airtight door so that maintenance can be carried out to the unit when necessary.—MILLING.

Chippendale

The leading furniture designer and builder of the Georgian Period was Thomas Chippendale.

Master carver that he was, his fame rests more securely on his book of designs. "The Gentleman and Cabinet Makers Director," which, circulated throughout the cultural centers of the world, inspired many cabinet makers to build finer furniture, which today is highly treasured in museums and private collections, not alone for its antiquity, but for its beauty, usefulness and superior craftsmanship.

SWISS SILK has long been treasured by the millers of America for its fine contribution to bolting efficiency.

GENUINE Swiss Silk

BODMER DUFOUR EXCELSIOR SCHINDLER WYDLER

Superb workmanship, flawless materials and infinite care in inspection insure the miller that every yard of these brands of SWISS SILK is as fine a bolting cloth as can be made anywhere by man or machine.

Helical Gears

Helical gears have many interesting applications. These have been called spiral gears in many cases, but this is really a misnomer. Where a line passes around a cylinder, and at the same time advances longitudinally at some given rate (like a stripe around a barber pole) it is a helical line. A helical gear blank may be regarded as a very short cylinder, (usually having a diameter many times its length) and teeth are cut on it helically, in the sense just outlined. Such gears can be used to connect parallel shafts, and they operate far more smoothly than ordinary spur gears, because action of the teeth is progressive as they roll upon one another.

However, this added smoothness in operation of helical gears is obtained at the cost of considerable end thrust. Thus, while vibration and back lash are to a great extent done away with, it is necessary to provide staunch thrust bearings for the shafts on which helical gears are mounted. The amount of end thrust is proportional to the particular helix angle at which the teeth are cut. There is an occasional case in which end thrust so generated may be used for a constructive purpose, but not often.

Helical gears may be employed not only to connect parallel shafts, but to connect shafts at angles with one another, providing their axial lines do not intersect. Thus, they are found convenient in many instances for driving a shaft at a right angle to the driving shaft, and are perhaps used most widely in this way, next to their employment for connecting shafts in parallel. However, a pair of shafts may be inclined at any angle with one another, and (so long as their axial lines do not intersect) a pair of helical gears may be designed and cut that will connect them so that one shaft will drive the other. Their chief use on non-parallel shafts is for light drives, and especially for drives where the speed ratio desired is not too far removed from 1 to 1.

How to Avoid Wear and Tear of Executives

Rather belatedly, the medical profession gives attention to the problem of exhausted business executives, especially the young ones. A leading article in the Journal of the American Medical Assn. contains a timely article on this subject by Drs. Sidney A. Portis, Irving Zitman and Charles H. Lawrence, who report experience and recommendations. Excerpts from the article follow.

"Industry has come to recognize that the toll of death and disability in the management group is excessive. This is evidenced by the report of the Labor Economic Section of General Motors Corp. in 1944 that 189 men in that corporation's management group had died in the preceding five years. Realizing that the health maintenance program for the supervisory group had proved inadequate, the corporation set up a program of diagnostic health examinations to prevent this catastrophic loss.

"The Life Extension Institute reported that of 1,000 holders of life insurance policies in amounts of $25,000 or over who had received extensive examinations since Jan. 1, 1938, of whom 81% were more than 40 years of age, 79% were found to have physical impairments (18.5% of which were high blood pressure and 22% abnormalities of the heart). More recently, periodic health examinations uncovered major medical disease in 25% of the executives examined.

"In Fortune for June, 1950, there was an article, 'Why Executives Drop Dead.' It quoted from a report of the Life Extension Examiners of New York that 60% of the executive group examined had conditions requiring a physician's attention, the larger part of them of a cardiovascular nature.

• **"Utterly Exhausted"**—"For many years we have seen young business executives in their early forties or fifties who became utterly exhausted. These executives had many disorders interfering with their efficiency. Apparently they started out in their jobs with all the zest and enthusiasm and ambition to reach a goal which would give them prestige, affluence and security. Most of them were college trained, and many had graduate education preparing them for their life work. Why did men with such drives manifest disabilities at an age at which they should have been most productive? Why did these men live under tension which not only affected them but projected their emotions on employees under their supervision? Why were some departments in industry more productive than others engaged in similar lines of work? Physicians must furnish answers to all these questions if the health and welfare of executives are to be preserved and if the harmony and safety of their employees are to be guarded at all times.

"We therefore undertook a comparative study of the last 50 business executives under the age of 50 who consulted us as patients and of a similar group of executives who were referred to us by corporations for prophylactic examinations.

"For comparison with the group of executive patients, we studied 55 executives under the age of 50 who were referred to us by corporations for prophylactic examination. These were subjected to a routine check-up consisting of a careful history of any complaints, previous illnesses, the last time a complete medical examination was made and any facts pertinent to an accurate inventory of any patient. A complete physical examination was made, and deviations from normal were noted.

"The average businessman, if he is in apparently good health, does not go to a physician of his own volition. Twenty-eight of 55 of the executives included in this study had not had a physical examination within the preceding two years. The predominant reason appears to be that everyone thinks his or her organs are superior, although he knows less about the workings of the human body than he does about an automobile. He does not take into consideration the fact that, although one can get new parts for an automobile, no new parts have been developed for the human machine at the present writing. The intelligent person who has an automobile will take that machine into a service station every one or two thousand miles to have it oiled, greased and checked, but he does not give equivalent care to his own body.

• **Industry's Real Stake**—"It is apparent that industry has a real stake in the management group, in which it has made a large investment. Moreover, the efficiency of workers is definitely related to the physical and emotional stability of their immediate superiors. Yet how many corporations and companies insist on periodic medical examinations for their executives? Review of the literature reveals that only a small percentage of corporations insist on and provide facilities for periodic medical examinations of their management group.

"The executive who knows his job well should be able to work with the ease and precision of a well oiled machine. But the executive who has the ability and is disturbed by some emotional factor finds his efficiency definitely impaired.

Coming up...more pancakes, more sales

To sell more of your pancake mix, you simply get more people to eat more pancakes. To do this, you simply provide the best mix possible. To do *this*, you simply leaven your mix with Monsanto HT Monocalcium Phosphate. Here are some of the advantages:

Better-eating pancakes — they are more tender, more crisp, have better flavor . . . Greater uniformity — first and last batch of mix in each package are more nearly alike. No "let-down" . . . Longer shelf life — premature reaction of the mix is minimized. Monsanto HT Monocalcium Phosphate is spray dried.

For complete information on added advantages of Monsanto Phosphates for leavening and mineralization, contact the nearest Monsanto Sales Office, or write MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 South Second Street, St. Louis 4, Missouri.

MONSANTO

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto Canada Limited, Montreal.

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Central States Millers, Chemists, Hold Annual Combined Meeting

FT. WAYNE, IND.—A program jam-packed with important subjects, and presented by an all-star line-up of speakers, held the attention of nearly 100 delegates to the joint meeting of the Cincinnati Section of the American Association of Cereal Chemists and the Ohio Valley District of the Association of Operative Millers, convening at the Hotel Van Orman in Ft. Wayne, Sept. 19-20.

Registration began the evening of Sept. 19, when the delegates also were entertained at a reception and social hour. The allied trades acted as hosts. Registration was resumed the following morning.

The convention program proper was begun the morning of Sept. 20, beginning with a film showing the habits and characteristics of the Norway rat. This was presented through the courtesy of the AOM, and shown on the theory that facts about the life of the rodent should be known before adequate steps can be taken to combat them.

J. E. Nation, National Biscuit Co., Toledo, Ohio, and chairman of the Ohio Valley District of the AOM, called the meeting to order. He introduced Herbert Merritt, Mayflower Mills, Ft. Wayne, who welcomed the guests.

First speaker on the formal program was T. F. Winburn, Industrial Fumigant Co., Kansas City, who outlined the responsibilities of each segment of the grain handling industry under the new grain sanitation program.

Sanitation Progress Report

Giving a broad outline of sanitation efforts over the last few years, Mr. Winburn pointed out that the milling industry ranks very high among the leading industries in the field of sanitation. He observed, too, that millers have been pretty much exonerated by the Food & Drug Administration of total responsibility for flour contamination.

Therefore, he said, each member of the grain handling team has responsibilities. The farmer, he said, should clean his storage space and institute a spray program. The grain should be protected from rodents and from contamination of all kinds on the farm. High moisture grain should be dried, and insect infestation should be prevented by fumigants.

The country elevator operator must see that the grain he takes in is in good condition and free of contamination. The most effective weapon of the country station, Mr. Winburn said, is to discount undesirable grain. The country elevator operator also must maintain a clean house, keep storage grain free of contamination and infestation, and ship the grain in a sanitary condition, with some attention given to boxcar condition.

Terminal elevators must make virtually the same efforts as the country station, only on a larger scale. The miller also must take sanitary precautions, and should test milling wheat and reject what is not acceptable for interstate shipment in the form of flour.

Herman Steen, vice president and secretary of the Millers National Federation, Chicago, followed with an illustrated report of the progress in consumer education on the use of wheat products.

Mr. Steen gave a detailed report of the work of the Wheat Flour Institute, the educational branch of the MNF, which uses 60% of the funds earmarked for the MNF. The institute, said Mr. Steen, is attempting, through the education of responsible and important groups, to maintain and expand the market for wheat and wheat flour products among the American population.

Open Forum Session

Mr. Steen was followed by an open forum, during which various questions were raised and discussed. The whole group participated in this phase. Carl N. Arnold, Acme-Evans Co., Inc., Indianapolis, was moderator of the forum.

Question No. 1: What measures are being taken to control spotty wheat conditions (fragments) in elevators prior to first breaks? Emmett Loy of Loy's Mill, Dayton, Ohio, said that in his operation a gallon of fumigant was used on every 1,000 bu. of grain when it was received. Also, he recommended frequent turning.

L. E. Collier, National Biscuit Co., Toledo, said that efforts are made to obtain wheat with little or no infestation. If it is spotty, however, the wheat must be treated to kill live infestation. It also is turned and fumigated at intervals.

Question No. 2: What improvements have been made in wheat cleaning for elevators and mills? J. George Kehr, AOM national president, Russell-Miller Milling Co., Buffalo, pointed out that more streamlined equip-

Licensed by H. J. Hersey, Jr.

TELLS HOW THE DAY "AC" DUST FILTER WILL FIT INTO YOUR OPERATION MORE EFFICIENTLY AND ECONOMICALLY

- Continuous-automatic cleaning with never a shutdown for shaking or rapping.
- Square-to-round inlet fittings with no dust catching ledges where dust can accumulate and become infested.
- More economy in space, installation and maintenance costs. Reclaims valuable product for added savings.

We've checked only three of the outstanding advantages you get in a DAY "AC" Dust Filter . . . there are many more that are especially desirable for controlling dust peculiar to the milling industry. That's why we've compiled this illustrated Bulletin No. 528 which will give you all the facts and figures on the operation of this highly efficient Dust Filter, showing why it is so applicable to your industry. The bulletin also shows how DAY engineers can help you toward the solution of any milling dust problem.

We want you to have the complete story, and a request on your letterhead will bring it to you. Simply ask for Bulletin No. 528 which contains complete, detailed information on DAY "AC" Dust Filters, a Dust Problem Analysis Sheet for your convenience in making a dust check in your plant, and information on other DAY air handling and air cleaning equipment.

Write for your FREE copy TODAY!

DAY SINCE 1881

The DAY Company

822 3rd Ave. N.E., Minneapolis 13, Minn.
IN CANADA: P. O. Box 70E, Ft. William, Ontario
Branch Plants in Ft. Worth, Buffalo and Welland, Ontario

Send us a sample of any stock you want to

PULVERIZE

You will receive an Engineering Report based on our Test Grind with the SCHUTZ-O'NEILL PULVERIZER

Do you have a production problem on stocks you grind, to get desired uniformity or fineness? Are you looking for increased output with a cost reducing method? Profit by Schutz-O'Neill's experience of almost 60 years in the rapid, dustless, accurate pulverizing of any dry, grindable stock. We have assisted major milling companies in solving some difficult size reduction problems. Your acceptance of this offer for a test grind does not obligate you. Schutz-O'Neill Pulverizers are made in 6 sizes with capacities up to 3,000 lbs. per hour.

The finest development of Centrifugal air-force pulverizing

For extremely fine grinding and uniformity of product, the principle of centrifugal impact with product carried by the air stream, has never been surpassed. Schutz-O'Neill Pulverizers utilize this principle to the fullest degree.

Send us stock sample—State fineness desired

You will receive your pulverized stock plus our Engineering Report giving recommended equipment, methods and mill plans. Literature upon request.

Phone MAin 5411

ESTABLISHED 1893 SCHUTZ-O'NEILL CO.

325 Portland Ave. • Minneapolis 15, Minnesota

Always reliable

The modern bolting cloth

FOR YOUR SIFTERS 2 KREFELD PRODUCTS OF OUTSTANDING QUALITY

GOLDEN ANCHOR BOLTING CLOTH

A silk bolting cloth unsurpassed as to durability, accuracy of weave, sifting performance and all other properties required of a reliable bolting cloth.

DURASET

The new synthetic fiber bolting cloth. Made of synthetic fibers specially developed for the manufacture of bolting cloth. No plain weave but leno weave which ensures firm and non-shifting meshes. Main advantages: greater durability, more precise sifting combined with a larger sifting capacity, non-blinding.

UNITED SILK MILLS
Krefeld Dhuenn B. Wermelskirchen
Western Germany / British Zone

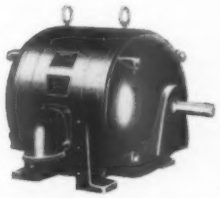
Imported and Distributed by

MECHANICAL FELT AND TEXTILES CO.
50 WEST 18th STREET, WEEHAWKEN, N. J.

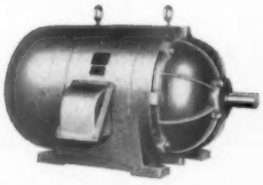
LIMA ELECTRIC MOTORS

— 1/3 to 150 HP —

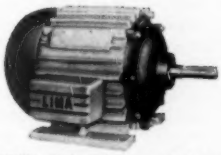
FOR ALL TYPES OF GRAIN HANDLING AND PROCESSING EQUIPMENT



Lima Type RS, semi-enclosed, dripproof construction in NEMA frame sizes 284 through 445.



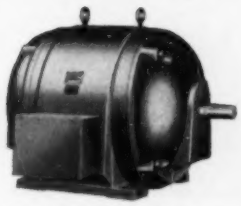
Lima Type RE, totally enclosed, fan-cooled construction in NEMA frame sizes 364 through 445.



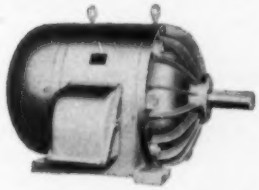
Lima Type E, totally enclosed, fan-cooled construction in NEMA frame sizes 224 through 326.

Lima Type ED, totally enclosed, fan-cooled, dust tight construction. U. L. Approved for Class 2, Groups F & G Service. NEMA frame sizes 224 through 326.

Lima Type EX, totally enclosed, fan-cooled, explosion-proof construction. U. L. Approved for Class 1, Group D Service. NEMA frame sizes 224 through 326.



Lima Type RS, semi-enclosed, dripproof construction in NEMA frame sizes 504U through 505.



Lima Type RE, totally enclosed, fan-cooled construction in NEMA frame sizes 504U through 505.

LIMA

REQUEST ADDITIONAL INFORMATION

Representation in principal cities

GEARSHIFT DRIVES & MOTORS

THE LIMA ELECTRIC MOTOR CO. 3942 FINDLAY ROAD—LIMA, OHIO

ment had been made. Mr. Arnold called attention to the greater tendency to aspirate grain.

Question No. 3: What experience has been had in drying wheat for storage, moisture reduction, resultant moisture and drier temperatures, etc.? Mr. Kehr said that some Canadian wheat had been dried with moisture as high as 28% down to 14%, with no appreciable difference in milling qualities.

Question No. 4: What is the most widely accepted way of making preventive maintenance inspections of milling and packing equipment? Robert Stillson, Northwestern Elevator & Mill Co., Mt. Vernon, Ind., said the mill manager should note unusual vibrations of machinery for trouble. All agreed that preventive maintenance was best. Mr. Kehr made the complaint that equipment is poorly made now. Mr. Collier said that good equipment should be bought at the start and adaptations made for individual mills. Austin Drake, Entoleter Division, Safety Car Heating & Lighting Co., said that often maintenance and instruction manuals were not used.

Question No. 5: Has anyone had experience with germ damaged or sprout damaged wheat? Wilbur Hanson, F. W. Stock & Sons, Hillsdale, Mich., related his experience with sprouted white wheat in 1950-51. A small amount, around 10% can be blended with other wheats with no ill effects on the end product, he said. This was strictly cookie type flour, he said.

Millers Favor Fixed Release

Question No. 6: For uniform milling, it is advantageous to establish set extraction for your first three breaks, or is it better to use the millers' "feel" as a guide? It was virtually unanimously agreed that there was a distinct advantage in roll setting, for definite releases, although occasional changes are needed for weather and grain quality changes.

Report by AOM President

At the luncheon, Mr. Kehr gave a report of the AOM. He claimed that the prime objective of the AOM is being met, illustrated by the large attendance at the district meetings. He said that the dissemination of information and its exchange is making for a more alert milling industry. He said he, as president, is very pleased with the progress made by the group.

Also introduced at the luncheon was R. A. Barackman, Victor Chemical Works, Chicago, president-elect of the national organization of the AACC.

J. R. Hedding, Marion (Ohio) Milling Co., chairman of the Cincinnati Section of the AACC, presided at the afternoon session. First speaker was Howard M. Simmons, Midwest Laboratories Co., Inc., Columbus, Ohio. Mr. Simmons discussed "Characteristics of New Crop and New Crop Flour."

Late rains caught part of the soft wheat crop just before harvest, said Mr. Simmons, producing some sprouted wheat, lower test weights and high moisture. However, moisture on the crop as a whole is the lowest in several years. Southern Indiana averages about 11.9%, Ohio ranges from 12.5% to 13%. The first Michigan white wheats averaged from 11.75% to 12%. Test weights average a little higher than last year, close to 59 lb., compared to 58.5 last year. No garlic or smutty wheat has appeared so far.

No radical change in soft wheat proteins is reported. The 1952 crop of soft wheat, both red and white, is said to be milling nicely, Mr. Simmons said.

Low-Ash Break Flours

For the first time since 1949, his charts showed, low ashes on the first and second breaks have been found. Late white wheat flours are running very low in ash and high in viscosity. Viscosities on red wheat flours range from 45 to 90".

"We have had no trouble," Mr. Simmons said, "in obtaining good results on self-rising and biscuit flours. The color and texture of the biscuits are good and the dry flour is excellent for making self-rising flours."

Cake flours, too, as a whole are good. A larger volume has been obtained this year than last. The only inferior cake flours were very short patents with a low protein, a low viscosity, and treated to a pH of 4.40. These cakes were small in volume and had a close, compact texture. The average pH on most cake flours is close to 5.00. Cracker flours seem to be available in about any viscosity range desired.

To summarize, Mr. Simmons said this year's crop is different from last year's in only a few places. As a whole the crop was harvested dry. It shows good milling qualities. The Michigan white wheats offer a little more of a milling problem. The ash possibly will average lower than on the 1951 crop.

Ending the formal session was a symposium on the current soil fertilization program, studying the effects of the program as apparent to various segments of the industry, presided over by Reuben H. Waitman, Igleheart Bros., Inc., Evansville, Ind.

Representing the agronomists was H. R. Lathrope, extension agronomist, Purdue University, La Fayette, Ind. Dr. Lathrope, an enthusiastic exponent of fertilizer, observed that soils have been getting progressively poorer since the Civil War. However, he said, that through the use of fertili-

Pfizer BI-CAP®

THE ORIGINAL FLOUR-ENRICHMENT CONCENTRATE

One Ounce of Each Bi-Cap Type Contains:

	SINGLE STRENGTH TYPE AM (mg./oz.)	SINGLE STRENGTH TYPE BM (mg./oz.)	DOUBLE STRENGTH TYPE CM (mg./oz.)
Thiamine Mononitrate (B_1)	369	369	738
Riboflavin	230	230	460
Niacin	2740	2740	5480
Iron	2400	2400	4800
Form of Iron	Sodium Iron Pyrophosphate	Reduced Iron	Reduced Iron

Check these Important Features:

- Small, Uniform-Size Particles... flow readily when added by automatic feeding devices, give even dispersion of vitamins throughout the flour.
- An Important Safety Factor... addition of Bi-Cap at the recommended levels results in enrichment with approximately 10% excess over the minimum standards.
- A Concentrate to Meet Every Miller's Needs... made in three types including single and double strengths with two different types of iron. Made with Thiamine Mononitrate for improved Vitamin B_1 stability.

Specify Bi-Cap...the original, easy-to-use flour enrichment concentrate! Supplied in 25-lb., polyethylene-lined fiber drums and stocked in conveniently located warehouses.

CHAS. PFIZER & CO., INC.
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices:
Chicago, Ill.; Nashville, Tenn.; San Francisco, Calif.; Vernon, Calif.

Manufacturing Chemists for Over 100 Years

PFIZER

zer, farmers had managed to increase production.

In 1951, he said, Indiana used 76,961 tons of nitrogen, against 25,000 used by Illinois. He maintained that growers can obtain seven more bushels of wheat per acre through the use of nitrogen. He said the use of nitrogen is increasing each year, and that that chemical, as well as phosphorus and potash, are the most important. Slides were used to show the effect of insufficient amounts of these materials in the soil.

The case of the cereal technologist was presented by C. E. Bode, Soft Wheat Quality Laboratory, Wooster, Ohio. He discussed the effect on quality characteristics of wheats of various fertilizers applied at seeding time. The character of wheat can be affected greatly by the time of application and the combination of fertilizer used, he disclosed. Particularly vulnerable in this respect is the protein content, his experiments showed. He also discussed foliar spraying experiments.

J. E. Anderson, Igleheart Bros., Inc., presented the observations of the miller in regard to the use of fertilizer. He said there is little information available on the comparative milling qualities of fertilized and unfertilized wheat, and he was unwilling to draw definite conclusions. He believes, however, that no great change has been effected by the use of fertilizer. He pointed out, however, that recent crops have been higher in viscosity and stronger in gluten, but he was not sure that this could be attributed to fertilizer use.

George Garnatz, Kroger Food Foundation, Cincinnati, said it was difficult to assess the effect of fertilizer on the baking characteristics of flour ground from wheat produced by the use of fertilizer, because of the seasonal variations of moisture, its timing, and temperature. He observed that the yield of protein is affected, but the quality of this protein is yet to be determined. He agreed, however, that the time is at hand to seriously assume the artificial fertilization of the soil.

For the last several years, Dr. Garnatz said, advances in baking technology have more than compensated for any effects fertilization have had on baking.

The formal session was followed by a business meeting of the AACC, at which time it was decided that the next meeting of the Cincinnati section would be held in Columbus, Ohio, late in January. The AOM held no business meeting, but Mr. Nation said its members would be notified of the time and place of the next meeting.

At the annual banquet in the evening, held in the Chatterbox Room of the hotel, the delegates were greeted by Miss Pearl Brown, Perfection Biscuit Co., Ft. Wayne. She introduced Dr. C. G. Ferrari, technical director of the J. R. Short Milling Co., Chicago, who sketched the history and importance of wheat milling and its production into bread.

Many specialized skills go into the handling of grain from its planting until ground into flour and made into bread, he said, including those of the farmer, engineers, plant breeders, agronomists, cereal chemists, plant pathologists, entomologists, mechanical engineers, chemists, commodity market specialists, transportation experts, grain storage specialists, bakers and advertising men.

During the convention, the Westinghouse Electric Corp., had available an X-ray inspection unit for observation and testing samples of grain. This drew considerable attention.

Millers Hear About Wheat Quality at Fall Meeting of District 7, AOM

FT. WORTH—District No. 7 of the Association of Operative Millers held its fall meeting at the Hilton Hotel, Ft. Worth, Sept. 13. Attendance was good, with approximately 85 millers registered.

A report on the quality of the new crop of wheat was a feature of the meeting.

The meeting was called to order at 10 a.m. by Willam B. Ball, General Mills, Inc., El Reno, Okla. A film showing a pneumatic mill in Italy proved of considerable interest to the audience. The film followed the detail of the flow of the mill from wheat-cleaning machinery on through the entire process. It was narrated by George Silha, Quaker Oats Co., Sherman, Texas, in the absence of Frederick Schiess of Buhler Bros., Inc., who was unable to be present. Following the film Mr. Silha answered questions regarding the operation of the Buhler pneumatic equipment.

Mr. J. George Kehr, Russell-Miller Milling Co., Buffalo, the association's national president, gave a short talk before the morning session adjourned. Mr. Kehr expressed his gratitude for the opportunity to meet with the southwestern millers and touched briefly on the future plans of the association and expressed the hope that everyone could come to Minneapolis for the national convention next spring.

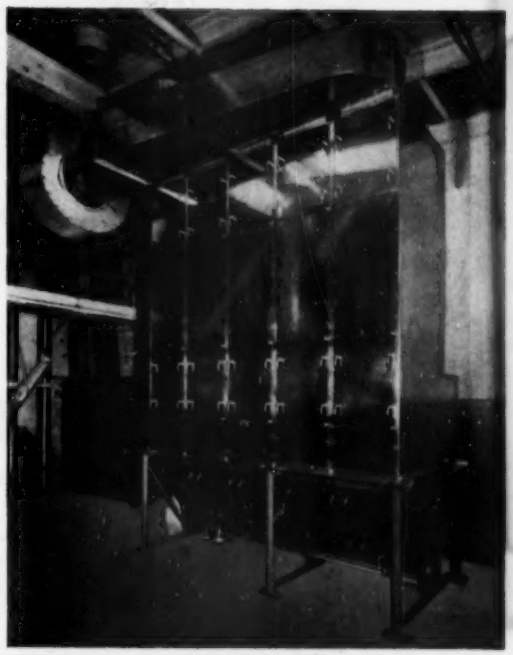
The afternoon session was opened by Donald S. Eber, the national sec-

$ave $ out of DU$T

Your mill benefits from the most improved dust control equipment when you have the Simon Suction Filter Dust Collector.

Dust laden air that escapes to the atmosphere is both a nuisance and a waste of valuable stock. This mill problem is effectively solved with the Simon Suction Filter Dust Collector. Self-contained, all-metal, this unit needs no accessory equipment except a fan and connecting ducts. Dust is collected at practically 100% efficiency, permitting air to be blown out of the flour mill without costly loss of stock, or into the building without risk of dusty atmosphere.

ADDED ADVANTAGES: Cleaned air from collector can be returned to mill to save heat in winter, and blown outside in summer to control humidity · Stops the dust nuisance · Proven by years of experience throughout the world · Streamlined ALL METAL design with minimum ledges and dead spots · Minimum maintenance cost · Low power — 1-HP to operate 12-section unit · Operates under suction, eliminating dust leaks.



The Simon Suction Filter Dust Collector
U.S. Design and Manufacture by
ENTOLETER DIVISION

Write to us for complete information on "ENTOLETER" Centrifugal Machines and the Simon Suction Filter Dust Collector. We will be glad to make recommendations to meet sanitation and dust control problems encountered in mill operation. ENTOLETER DIVISION, The Safety Car Heating and Lighting Co., Inc., 1189 Dixwell Avenue, New Haven 4, Connecticut.

"ENTOLETER"
Centrifugal Machines include:

- "ENTOLETER" Insect Destroyers
- "ENTOLETER" Scourer Aspirators
- "ENTOLETER" Centrifugal Hullers
- "ENTOLETER" Impact Mill
- "ENTOLETER" Mixers

ENTOLETER
CENTRIFUGAL MACHINES

CONTINUOUS INSECT CONTROL SYSTEM

retary, who presented reports on the progress of the various committees. Mr. Eber displayed a trophy which will be awarded to the miller who obtains the most new members during the year. The trophy is being contributed by Mr. Kehr who has long been chairman of the membership committee. Following the committee reports, Mr. Eber showed the film "Habits and Characteristics of the Norway Rat."

For the benefit of those millers who were unable to attend the last national convention in Buffalo, Ben Blackburn, Fant Milling Co., Sherman, Texas, gave a brief resume of the activities and technical reports.

The milling characteristics of the 1952 southwestern winter wheat crop came up for discussion during the afternoon session. The discussion was led by R. H. Jordan of Oklahoma City. Mr. Jordan first pointed out some of the undesirable aspects of the 1952 crop. Perhaps of greatest interest to the millers was the reports on ash. Mr. Jordan reported that ash was high in almost all areas where protein wheats were available and that the only low ash area was that area where the early varieties were planted. For the most part this area is confined to Oklahoma. He also stressed the vetch problem especially in the Oklahoma area. He said that 2% or more vetch in a sample of wheat would be reflected in higher ash, higher protein and poorer dress of the flour. Another pessimistic aspect which was pointed out by Mr. Jordan was the increased planting of the undesirable varieties such as Red Chief and Chiefkan.

On the optimistic side he reported that infestation is much lower in cars inspected this year. Percentages of sick wheat also show a marked decrease over last year's figures.

Phillip Paul, Allis-Chalmers Mfg. Co., Dallas, discussed motor application in flour mills. The millers were shown pictures of different types of electric motors with special attention to the type of housing. Mr. Paul dealt primarily with the problem of selection of the proper type of motor with regard to fire, explosion and moisture.

The meeting was climaxed by a banquet at 7:30 p.m. which was well attended by millers and their wives. As this meeting closed there were tentative plans to follow the example of the chemists and meet early next spring at Lake Murray, near Ardmore, Okla.

COLUMBIA-SOUTHERN

SODIUM BICARBONATE

FLOUR BLEND

Columbia-Southern Flour Blend comprises the perfect trio—it's white, free-flowing, smooth-blending—to make a fine quality product for your use.

Columbia-Southern "bicarb" is made in a variety of screens—of uniform particle size—to blend just right with your self-rising flours. It is a specially prepared mix of U.S.P. Sodium Bicarbonate and Tri-Calcium Phosphate.

So, on your next order, specify Columbia-Southern Flour Blend and get all three: it's white, free-flowing, smooth-blending.

COLUMBIA-SOUTHERN
CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
FIFTH AVE. AT BELLEFIELD · PITTSBURGH 13, PA.

EXECUTIVE OFFICES: FIFTH AVENUE AT BELLEFIELD, PITTSBURGH 13, PA. DISTRICT OFFICES: BOSTON • CHARLOTTE • CHICAGO • CINCINNATI CLEVELAND • DALLAS • HOUSTON • MINNEAPOLIS • NEW ORLEANS • NEW YORK • PHILADELPHIA • PITTSBURGH • ST. LOUIS • SAN FRANCISCO

—BREAD IS THE STAFF OF LIFE—

International Mill at New Prague Sets New Safety Record

CHICAGO — The New Prague, Minn., mill, long a pace setter in International Milling Co.'s safety program, passed one of the great milestones in safety on June 30, 1352. Over five years of sincere and conscientious effort on the part of every New Prague employee went into the making of the 1,000,000 man-hours of operation without a lost-time accident. New Prague is the first International plant to prove that 1,000,000 man-hours of safe operation can be realized in the flour milling industry. Its safety records have been an inspiration to all company safety programs, and the many congratulatory letters indicate the sincere interest other plants have in their record.

There is no secret formula which went into the making of the 1,000,000 man-hours record. It was simply that every employee was interested and active in the safety program to the extent that safety was first and foremost in their daily work schedule. Sparking the safety drive were five different safety committees during the period that the 1,000,000-man-hour record was being made. Each one had a vital part in making the record. Each committee did its best to keep the interest in the safety program at a high level. Each committee continued to make recommendations to eliminate all possible safety hazards which might be the cause of an accident. As these recommendations were made, a conscientious effort on the part of management and the maintenance department to correct the hazards enabled New Prague to keep its plant a safe place to work. Each foreman was a vital link in the safety program as he extended his supervisory duties to include the instructions of new employees on the company safety program. This 1,000,000-man-hour record has proven that when every single employee at a plant cooperates in the safety program, it is possible to prevent all disabling injuries. — National Safety Council News Letter.

—BREAD IS THE STAFF OF LIFE—

Screw Holder

A piece of friction tape doubled over the end of a screwdriver bit makes a very satisfactory screw-holder for those hard-to-get-to locations. The fit of the bit or blade of the driver into the slot should be snug, and will be as satisfactory a holder as the magnetized screwdrivers or those with the special clip.

—BREAD IS THE STAFF OF LIFE—

NEW GRAIN FIRM

SALINA, KANSAS—A new grain company has been formed here. The Cloud-Wright Grain Co., Inc., has been incorporated, with J. C. Cloud as president and K. L. Wright as secretary-treasurer. Both formerly worked for the Smoot Grain Co. The firm will operate as a grain commission house, with offices in the United Bldg.

Varied Program Presented at AOM Fall Meeting

KANSAS CITY—Variety was the principle which guided District 2 of the Association of Operative Millers through a successful program at the Hotel Aladdin in Kansas City Sept. 20. A tour of a feed mill, a question-and-answer panel, motion pictures and several short talks constituted the program which was under the chairmanship of John J. Womack, General Mills, Inc., Kansas City.

More than 90 persons attended the sessions which were divided into two sections, one for flour millers and the other for feed millers, for the morning. The feed section accompanied W. H. Parker, superintendent of the Kansas City feed mill of General Mills, Inc., on a tour of that mill.

At the same time the flour millers convened at the hotel for a session with a panel of experts on general milling topics. Appropriately clad in academic caps and gowns were panel members Jack Spahn, Ismert-Hincke Milling Co., Topeka; Major S. Howe, J. C. Lysle Milling Co., Leavenworth; Prof. E. P. Farrell, department of milling industry, Kansas State College, Manhattan; Harry Taylor, Rodney Milling Co., Kansas City, and George J. Tesarek, Quaker Oats Co., St. Joseph. Mr. Womack was the moderator.

Following luncheon, brief summaries of the morning sessions were presented by Charles Mannschreck, Dannen Mills, Inc., St. Joseph, and Mr. Womack. W. R. Goodrick, Kansas Flour Mills Co., Kansas City, was chairman of the afternoon session.

Safety precautions in the maintenance and operation of hammermills and attrition mills were outlined by Mr. Tesarek in the featured address of the meeting. Mr. Tesarek said that if one has a choice between attrition and hammermills, he believes that hammermills are the safer grinders to operate. The most important point in the prevention of explosions and fire, regardless of the type of mill used, is that every means should be employed to remove tramp iron and stones, Mr. Tesarek said. Sparks from the contact of metal and stones against the hammers and screens have caused numerous fires and explosions, he said.

Mr. Tesarek used a schematic drawing of a recent feed mill fire to illustrate the quick spread of an explosion and resulting fires from the grinders to elevators and dust collectors.

He said that several means can be used to prevent the spread of fire or explosions from a source. Openings leading from the explosion chamber to the outside of the mill will tend to carry a major portion of the explosive force to the open air, he said.

Several preventive measures were suggested by the speaker to reduce the hazard of explosions and fires. He recommended that the mill should be kept clean, especially around the dust collectors or air filters.

Organization of mill fire brigades and regular fire drills are an essential part of good fire prevention programs, he said. In the operation of a hammermill a point which is often overlooked is that the load should be kept in the mill when it is shut off at the end of a run, Mr. Tesarek said. This reduces the chance of running steel against steel in the mill, he pointed out.

The meeting concluded with a showing of the AOM film on rat control, which was shown and narrated by Donald S. Eber, executive secretary of the AOM.

Jack D. Dean, executive secretary of the Midwest Feed Manufacturers Assn., was a special guest at the meeting. He invited all of the men to register for the third annual formula feed production school to be held by the Midwest organization in Kansas City Nov. 17-19.

Good Human Relations

By G. A. Harmon, General Mills, Inc.

Some time ago I attended a conference of supervisors. The subject up for discussion at the conference was, "How Can a Supervisor Build and Maintain the Respect and Confidence of His Employees?" The conference leader was a very capable fellow and I was particularly impressed by his introduction—the setting that he established to orient the thinking of the group. It went something like this:

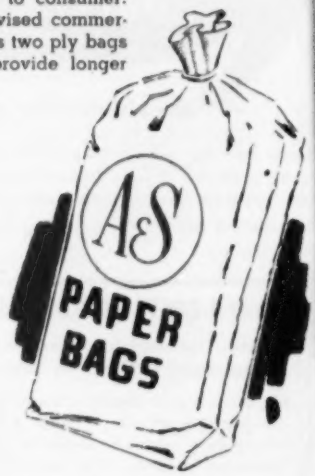
"Gentlemen, two weeks ago we discussed the attitude side of a supervisor's job—the change in viewpoint and thinking that must take place when a man moves up and out of the employee ranks into a supervisory or management job."

"Last week we discussed what I

protects as it sells...

SUPER-PROTECTION

The exclusive two ply construction gives A&S Super Gloss two ply bags extra strength...added product protection from packer to consumer. Laboratory drop tests and supervised commercial shipments prove Super Gloss two ply bags deliver the goods safely and provide longer shelf life.



SUPER-SALES

With self service shopping in super markets, the packages that sell themselves must have a maximum of shelf attraction. The Super Gloss Hi-White coating keeps inks on the surface, providing sparkling bright printing that "stands out in the crowd."

SUPER-SERVICE

Send for samples of Super Gloss two ply A&S bags—your requests will receive the prompt, intelligent attention that has been the keystone of Arkell & Smiths' customer policy for four generations.

ARKELL & SMITHS · THE OLDEST NAME IN PAPER BAGS · A&S

ARKELL and SMITHS

CANAJOHARIE, N. Y.
WELLSBURG, W. VA.
MOBILE, ALA.

call the mechanics of managing—establishing responsibilities, identifying rights, privileges and authority, and how to get a job done right."

"Today I've suggested we discuss the human factor. You know to me this is the most important phase of the managing job. Of course a manager works with three elements—men, materials and machines—but a manager works primarily with people. He is a success or failure based on his ability to get results through people—how well he learns to understand them, to lead them, and to develop them."

With that he launched the group into the discussion. But that statement, "He works primarily with people; he is a success or failure depending on his ability to understand, to lead and to develop people" seemed to me to spell out the goal of sound human relations—to understand, to lean, and to develop people.

I would like to pass along some observations on the first element of the "three-m elements"—men, and the ability to understand them.

We in General Mills have one basic principle that we use to guide all our efforts in building sound human relations.

It is this: The goals, the ambitions, the wants and the hopes of the worker are exactly the same as those of the company.

For emphasis, let me state it another way: The goals of the employee are no different from those of the employer.

It is our belief that human relations in industry depend upon how generally this principle is understood and accepted and how well it is applied. And when I say recognized and accepted, I mean by both the employer and the employee. It is no one-way street. It gives guidance to considerate effort on the part of the employer and meaning to the actions of employees.

Let's explore it a bit further. Of course, I could wrap it all up in a single simple package by saying: "Both business and labor constantly strive for a better standard of living for themselves," and it would be an accurate observation.

But the parallelism stands being broken down in any degree of minuteness of detail, so I'll start with what the employee wants and hopes for—what he seeks in the way of satisfying his ambitions. I'm taking this course because management people often reflect that workers have a long and rather specific list of wants, but—for some strange and unexplainable void of observation, they fail to recognize that they personally, and the business or corporation as well, have the same identical wants. These wants and ambitions are not peculiar to some one element of humanity or one phase of industrial organization.

There have been many lists of "employee wants or needs" developed. You have probably seen a number of them. This list that I shall use is not the last word nor the most exhaustive, but is rather a reasonable composite. Let's see how this idea develops.

To repeat: An employee's wants are no different from those of his employer. Both want security first. Included in "security" are, for the employee: steady employment, a chance for advancement, fair treatment, an important job and the knowledge of what is going on in his company.

The employer, too, wants security in the form of steady business, a chance to grow, fair treatment, a respected business and the knowledge of what is going on in his industry.

In addition to security, the worker wants recognition. So does his employer. The employee's recognition includes fair pay, a chance to earn more, a chance to be an important member of his department organization, appreciation of his effort and an opportunity to be listened to.

For the employer, under the parallel desire for recognition are included these factors: the employer wants his company to earn a fair profit, he wants his company to have a chance for more profit, he wants his company to be important in its industry. He wants his company's efforts appreciated, and he wants his company to win respect in its industry.

It takes all kinds of people to make up this world. Sometimes it probably seems hopeless to try to understand why they behave as they do. But I would like to leave you with the conviction and understanding that "what people want" out of their time here is not complex, not peculiar, and that there is little difference among them.

Where they differ is in the means by which they try to satisfy those wants. What they want—and what you and I want—is similar. It is our belief that good human relations can only be accomplished in the extent that this principle is understood.

—BREAD IS THE STAFF OF LIFE—

Fire Protection

A hand fire extinguisher should be included as a piece of essential equipment with any portable welding outfit. Likewise, the fire extinguisher should accompany a blow torch or bearing metal pot and burner.

Want us to PROVE it?

HOFFMAN Heavy-Duty MILL VACUUM CLEANING Pays for Itself Quickly

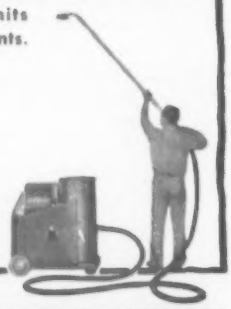
then write for your FREE SURVEY now!

Learn how your mill can be kept thoroughly clean (free from fugitive dust and dead stock that cause explosion hazards and infestation) — and, get savings that pay back your investment. Ask us for a free survey. No obligation. Backed by years of experience in helping the nation's finest mills to keep cleaning costs low.

LOWER COSTS • GREATER SAFETY • BETTER SANITATION

with Stationary Systems or Portable Units Engineered to Meet Your Mill's Requirements.

Big economies in cleaning time and manpower are just one of many savings with Hoffman heavy-duty vacuum cleaning equipment. Stationary systems, in a complete range of sizes, for cleaning several areas or floors at same time. Four sizes of portable units, equipped with Class II, Group G motors. *At right,* the Hoffco-Vac 15 portable for smaller mills, or supplementary cleaning in large mills.

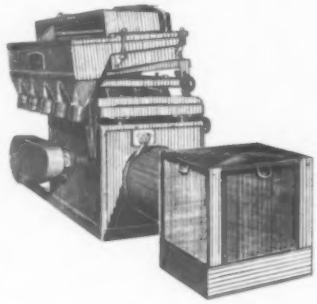


Write Now for Special Milling Bulletin A-710

AIR APPLIANCE DIVISION U.S. HOFFMAN MACHINERY CORPORATION
100 EAST 42nd STREET, NEW YORK 17, N. Y.
CANADIAN PLANT CANADIAN HOFFMAN MACHINERY CO. LTD. NEWMARKET ONT.

CHECKERBOARD ELEVATOR CO.
MILLING WHEAT • COARSE GRAINS • MILLFEED
Hard and Soft Winter Wheat
ST. LOUIS • KANSAS CITY • MINNEAPOLIS • DENVER • BUFFALO

we can give you 58 good reasons why...



. . . it makes good sense to sit down and study out all the economic advantages of cleaning, classifying, and up-grading grain products with Sutton Specific Gravity Separators and Air-Float Stoners. Upon request, you will immediately receive a list of 58 different grain and cereal products, each representing a distinct separating problem solved by *"effecting a difference in specific gravity through air-flotation."* Chances are S S & S Process will answer your separating problem, too.

ADDRESS DEPT. J

SUTTON, STEELE & STEELE, INC.
1031 SOUTH HASKELL • DALLAS, TEXAS

SALES AND SERVICE: DALLAS • COLUMBUS, GA. • NEW YORK • PITTSBURGH • CHICAGO MINNEAPOLIS • JACKSON, MICH. • DES MOINES • SAN FRANCISCO • TWIN FALLS, IDAHO FOREIGN: WINNIPEG, CANADA • SAO PAULO, BRAZIL • LONDON, ENGLAND

SUTTON, STEELE & STEELE, INC

PAPER SACKS FOR MILLERS
The Chatfield & Woods Sack Co.
CINCINNATI, O.

LET DOTY DO IT
IF YOUR LAB IS OVERLOADED
Sanitation Analyses - Wheat and Flour
Doty Technical Laboratories
KANSAS CITY 13, MO.

Flour Enrichment

(Continued from page 1a)

deliver enrichment mixture at the desired rate, with a low percentage of variation. But the miller must not think that he can set the feeder and then forget about it for days or weeks at a stretch. Unless the handwheel or the feed slide or the quadrant of the variable speed drive is locked in some foolproof manner, there is always a possibility that the setting may change. Feeder settings should be included in the records kept for every feeder in operation.

Control of Feeders

How can the miller be reasonably sure that his enriched flour will meet the minimum and not exceed the maximum requirements for the four enrichment ingredients?

First of all, he must make sure that the enrichment mixture is being added to the flour at a rate of ¼ or ½ oz. per hundredweight of flour, plus whatever overage may be deemed necessary to cover variations due to load changes on the mill or shifts in atmospheric temperature and humidity.

An over-all check on the number of pounds of enrichment mixture used over a given period, or of the time required to lower the level in the feeder hopper by a certain amount, is useful but it does not always explain deficiencies or surpluses that may show up in samples when checked. The miller must know how much enrichment mixture is going into the flour at all times.

Probably the most satisfactory means of obtaining this information is to mount the feeder on a scale and to set up a schedule for regularly checking the loss in weight. The scale beam may be balanced while the feeder is in operation, so that feeding is not interrupted. This takes less time than a weight check on the mixture actually delivered by the feeder in a period of several minutes, and is proof of the amount fed since the last reading was taken.

With dial scales, no balancing of the beam is necessary, and the amount fed can be read at a glance. A daily shift record form with provision for hourly readings can be worked out.

The shift record should include the following information: Name of person checking the feeder, the time checked, the dial setting, the weight of enrichment ingredients remaining in the hopper, the amount fed during the intervening period since the feeder was last checked, the elapsed time between weighings, and any remarks that might have any bearing on the rate of feed.

If the feeder is not mounted on scales, check weighings should be made at regular intervals as well as at any time when changes are made in the feeder setting or in the kind of enrichment mixture used. Such a check is made by holding a piece of cardboard or metal under the discharge for an accurately measured time interval, interrupting the flow completely. The mixture delivered by the feeder during a given number of minutes is then weighed on an accurate scale. The duration of the test and the amount to be weighed will depend on the rate of feed and the accuracy of the scale.

The man making the check weighings should be provided with a stopwatch, or an inexpensive photographic timer may be mounted near the feeder. A chart should be placed near the feeders, giving detailed instructions for the test, and showing the range of settings on the scale or dial of the feeders.

Results of check weighings should be entered on a record sheet, which may also show rate of enrichment feed in pounds per hour, rate of flour production in hundred weight per hour, and feeder settings.

A good rule for frequency of check weighings is at least once on each trick. Some of the largest mills make these checks twice on each trick, and it has been reported that certain mills check once each hour.

Checking Enrichment Levels

Accurate determinations of the vitamin and iron content of enriched flour require a well-equipped laboratory and trained personnel. Since overnight digestion is required to insure complete extraction of the enrichment ingredients, results on a sample submitted to the laboratory one day cannot be expected until the next day, at the very earliest.

For control purposes, the laboratory usually reports thiamine only, sometimes including the riboflavin figure. Manufacturers of enrichment mixtures take the greatest pains to insure the proper levels of thiamine, riboflavin, niacin and iron in their products.

Because of the unavoidable time lag in obtaining vitamin assay results, the miller has need for quick tests, even if not so accurate as those of the laboratory.

Ultraviolet Light Test

When enriched flour is slicked up and examined in the usual manner, it can barely be distinguished from plain flour in the dry state, unless the feeder is out of control or the flow of flour has slackened off, resulting in heavy overenrichment. But if the freshly dipped slick is examined in a dark room or viewing box under ultraviolet ("black") light, enriched flour will exhibit a characteristic fluorescence by which it can readily be distinguished. Plain flour shows uniform, bluish-white fluorescence when thus examined, whereas enriched flour soon develops a multitude of brilliant yellow fluorescing points against a bluish-yellow background. The over-all fluorescence serves as an approximate index of the amount of enrichment present. It is at least possible to tell whether a flour is fully enriched or grossly over or under enriched.

This test has the advantage that it can be made quickly by the miller himself or by the mill control laboratory. If no dark room is available, the ultraviolet lamp can be enclosed in a wood or metal viewing box, into which dipped slicks may be inserted by means of a door or sliding drawer.

Ultraviolet Light Sources

The source of ultraviolet light for such tests should be intense enough to produce brilliant yellow fluorescence in a sample containing the proper amount of enrichment. Several ultraviolet lamps are available, equipped with filters that pass only the effective ultraviolet rays.

A new and inexpensive source of ultraviolet light is a fluorescent tube made of dark glass. This glass serves as a filter, through which only ultraviolet can pass. The tube is the same size as the 15-watt fluorescent tube (about 18 in. long over-all) and will fit the ordinary desk type fluorescent lamp fixture. Two or more of these tubes, mounted side by side, will furnish enough ultraviolet radiation to produce brilliant fluorescence in a dipped slick or in clarified water extracts of enriched flours.

Test for Riboflavin

A more accurate estimate of the riboflavin content as indicative of the levels of enriched flour may be made by means of a test developed several years ago by Paul Hodler and George Garnatz of the Kroger Food Foundation and reported in Cereal Chemistry, November, 1945, pp. 559-560. This test involves examination of clarified water extracts of enriched flours under ultraviolet light, in comparison with similar ex-

The "WILLIAMS WAY SERVICE"

✓ CHECK YOUR—
Stock of Wire Cloth
—then order Tyler Wire Cloth
"The WILLIAMS WAY"

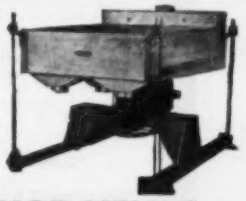
MOST ITEMS IN STOCK
Ready To Ship Same Day

Also, HART-CARTER GRAIN CLEANING EQUIPMENT

- ☐ Belt Dressing and Cement
- ☐ Lacers and Hooks
- ☐ Tyler Wire Cloth
- ☐ Bindo Edging for Silk and Wire Sifter Cloths
- ☐ Nylon and Canton Flannel Sifter Stockings
- ☐ Graton & Knight Research Leather Belting
- ☐ Bodmer and Schindler Swiss Silks
- ☐ Solid Woven Cotton Belting
- ☐ Moister Testers
- ☐ Larvacide (chloropicrin) and ISCO sprays, fumigants
- ☐ Conveying and Transmission Equipment
- ☐ Sifter Brush Belting and Rivets
- ☐ Sieve Plush and Sieve Lining
- ☐ Elevator Buckets and Bolts
- ☐ Roll and Purifier Brushes
- ☐ Reel, Bran Duster Brushes
- ☐ Made-up Cloth Cleaners
- ☐ Rubber Belting
- ☐ Universal Grain Dryers

H. R. Williams Mill Supply Co.
Everything for Mill and Elevator
1320 MAIN ST. Phone Victor 3232 KANSAS CITY, MO.

NOR-VELL
GYRATORY SCREEN for
CLEANER SEPARATIONS
LARGER CAPACITY



- High Speed
- True Circular Motion
- Cleaners Used on Wires
- Heavy Construction
- For Continuous Operation

Write for Further Details. No Obligation.

NOR-VELL, Inc.
FORT SCOTT, KANSAS

A. E. BAXTER ENGINEERING CO.
Designers and Engineers for Mills, Elevators and Feed Mills
900 ELECTRIC BUILDING BUFFALO 3, NEW YORK

tracts of enriched flours of known riboflavin content.

By this method, using a series of flours as reference standards, representing small increments of enrichment, it is possible to estimate the level of enrichment within about 10%. Results check quite closely with those obtained in the laboratory by longer and more refined methods.

The Hodler-Garnatz test can be made in one hour. In the words of the authors:

"Rapidity and ease of manipulation of the test make it valuable for the rapid examination of large numbers of samples without the use of expensive equipment. It is well adapted to routine mill control practice, and a highly skilled operator is not needed for accurate estimation."

Summary

The following points are of prime importance in maintaining uniformity in enrichment operations:

1. Keep feeders in good working order by periodical cleaning and servicing.

2. Inspect feeders regularly to make sure hopper is filled, feeder is functioning normally and setting has not be changed.

3. Where enrichment is applied by blower, make sure that just enough air pressure is applied to move the enrichment mixture continuously through the air hoses to the mixing conveyor or agitator. Check all parts of the system for leaks that might cause losses of enrichment mixture.

4. In gravity installations, make sure that no enrichment mixture is being lost through blow-back at the point of application.

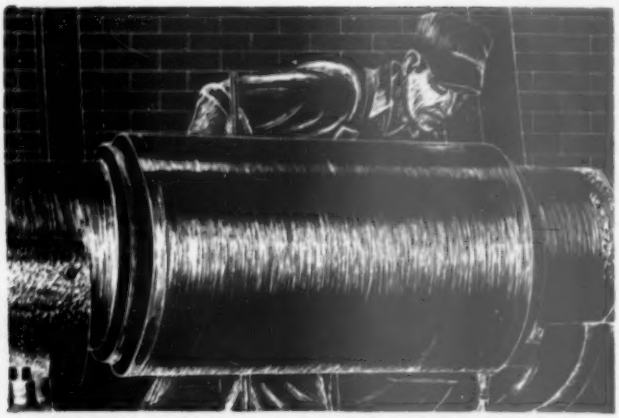
5. Take frequent readings if feeder is mounted on scale.

6. Make time check weighings at least once on every trick, also when changes occur in the mill which alter the flow of flour and call for resetting of the feeder.

7. Keep accurate records of enrichment consumption.

8. Supplement laboratory assays with quick tests for fluorescence of dipped slicks or clarified water extracts.

Difficulties in production of uniformly enriched flour will be reduced if these measures are taken.



Keep 'em rolling profitably

WITH ESSMUELLER ROLL GRINDING AND CORRUGATING

You keep your mill rolls operating at a profit with ESSMUELLER service. And you only pay .0030 to .004 cents per sack of flour ground to do it.

That small cost covers: regrinding and corrugating break rolls every 250 days of full time operation; regrinding smooth rolls every 500 days.

You increase profits through greater capacity with less power, improved uniformity, lower ash and faster production. Your profit in yield *alone* more than pays the cost of this ESSMUELLER service.

To keep mill rolls operating at a profit use ESSMUELLER.

Since 1878

The ESSMUELLER Company
Engineers Manufacturers
ST. LOUIS 1, MISSOURI KANSAS CITY 1, MISSOURI

PROTECT YOUR ELEVATOR

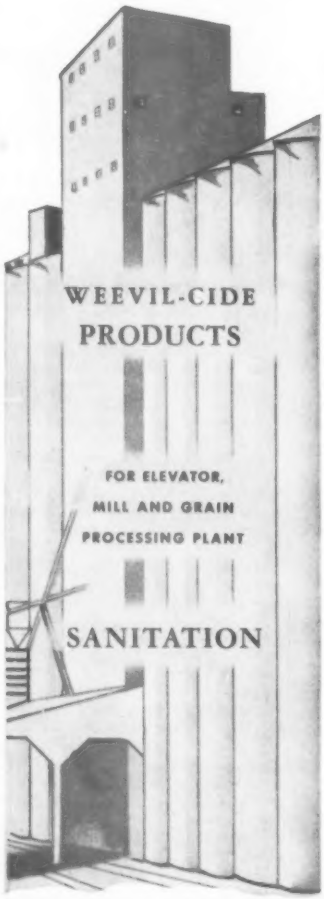
FROM EXCESSIVE MOISTURE AND GRAIN SPOILAGE...

When excessive moisture enters your elevator, grain spoilage follows quickly. Western Waterproofing Company's prompt protective and restorative action, however, checks water penetration at its source. Hundreds of elevator and processing plant owners have thus achieved 10% to 50% more insulation, less mold growth, slower temperature change, and dryer grain.

Specify Western Waterproofing Co. for:
Concrete Restoration • Mortar Joint Replacement
Pressure Application of Cement • Putting Joints in Movement

For folder "Maintenance and Restoration of Concrete Storage Tanks" write

WESTERN WATERPROOFING CO.
Engineers and Contractors
1223 SYNDICATE TRUST BLDG. ST. LOUIS 1, MO.
A Missouri Corporation Giving Nationwide Service



Weevil-Cide The DEPENDABLE GRAIN FUMIGANT

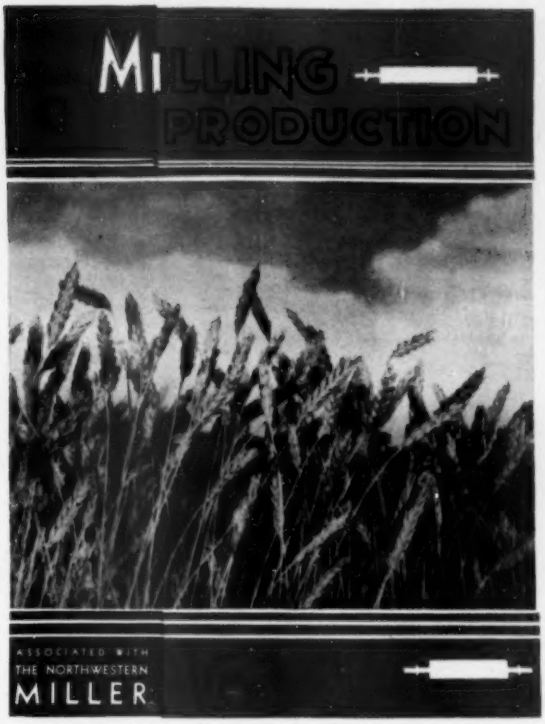
Contacta-Cide
Weevil-Cide Contact Spray

Dusta-Cide
Weevil-Cide Grain Surface Insecticide

Binsecta-Cide
Weevil-Cide Bin Spray

Rat-Cide
Weevil-Cide Rodent Bait

Write for information
THE WEEVIL-CIDE COMPANY
1323 UNION AVE. • KANSAS CITY, MO.



TRIPLE YOUR ADVERTISING EFFECTIVENESS

1. WORKING CIRCULATION —Studies of flour manufacture show that 1,100 of the flour mills in this country produce 98% of the flour. Milling Production with its controlled circulation reaches the key men in these 1,100 flour mills. This working circulation provides contact each month with the people who directly or indirectly control the buying — superintendents, operative millers, chemists and plant managers. *There is no waste circulation—only working circulation*—and you are assured of reaching your potential customers in the most productive mills.

2. LEADERSHIP MAKES READERSHIP — Readership surveys and unsolicited correspondence from its readers attest to the editorial leadership of Milling Production. That editorial leadership is held by complete words-and-pictures reports of the latest milling technology, current news, features and complete coverage of the activities of the industry's two technical associations. *The real price the reader of a publication pays is the amount of time he puts in reading that journal.* Over one half of the readers of Milling Production have requested that it be sent to their homes so that they may enjoy uninterrupted reading pleasure.

3. DOUBLE-DUTY DOLLARS —Money spent for advertising in Milling Production does double duty. In addition to reaching the production personnel, the advertiser's message is read in the Milling Production Section of The Northwestern Miller by the executives who approve purchase orders. *No other advertising medium in the flour milling industry offers this double-duty feature of reaching both groups* — mill technologists and executives—with the same advertising message and for the cost of one advertisement. Take advantage of this 100% coverage through one double-duty advertising contract.

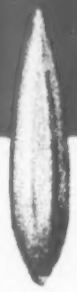
THE MILLER PUBLISHING CO.
The Businesspaper Family Serving the Related Fields of
Flour, Feed, Grain and Baking
THE NORTHWESTERN MILLER • FEEDSTUFFS
THE AMERICAN BAKER • MILLING PRODUCTION

MILLING PRODUCTION

118 South Sixth St., Minneapolis 2, Minn.
BRANCH OFFICES: New York, Chicago, Kansas City, Toronto

Because various grains differ in length

You can make exact separations



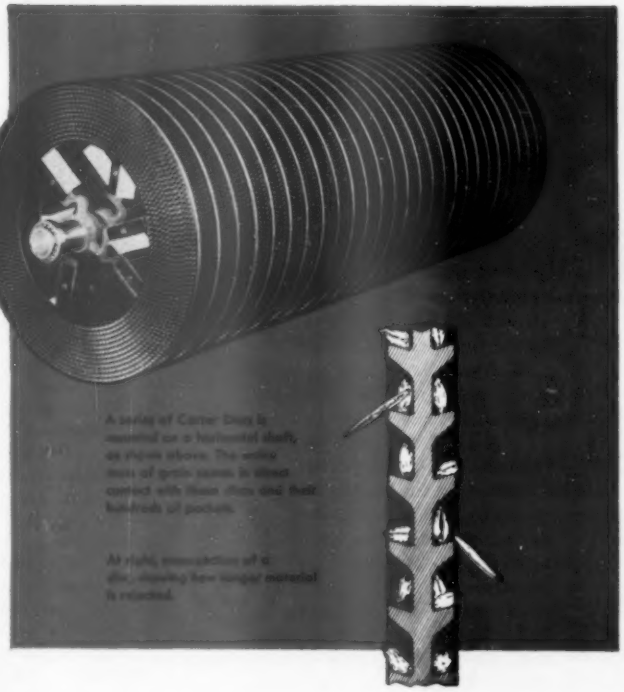
SOME GRAIN IS LONG

SOME IS MEDIUM

SOME IS SHORT

MANY grains are almost identical in width or thickness and would be difficult to separate if it were not for marked differences in their *lengths*. Oats, for example, are longer than wheat; cockle, on the other hand, is shorter than wheat. Because of these length differences, the Carter Disc Separator can make *exact* separations. By means of Carter Discs, which contain hundreds of undercut pockets, the grains or seeds are selected or rejected according to length. As the discs revolve through the grain or mixture, the pockets lift out the material they are designed to carry, and positively reject anything longer.

Take advantage of this accurate method of length separation. Install Carter Disc Separators now!



CARTER DISC SEPARATOR

HART-CARTER COMPANY

673 Ninteenth Avenue N. E., Minneapolis 18, Minnesota

Engineers and manufacturers of grain cleaning machinery